

Railway Age

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Equipment Orders

ALTHOUGH orders for locomotives and freight cars have been running behind those placed last year, passenger car orders have kept on a par with those placed in 1927. For the five months ended May 26, 1928, passenger car orders totalled 1,037, and in the same period of 1927 orders amounted to 1,039. While freight car orders have been a source of disappointment to the equipment industry, the fact that there are outstanding inquiries for about 5,000 freight cars, orders for which will do much toward placing the total on a par with that of 1927, carries some degree of comfort for those who have been hopefully awaiting the placing of equipment orders.

Maintenance of Men

MAINTENANCE of way and maintenance of equipment are highly important phases of railway activities. Maintenance of men, however, is another important factor which has not been receiving the attention it deserves. The investment made by the railways in their officers and employees is colossal. It amounts to many millions in the aggregate; each individual employee represents a respectable sum. Realizing this, some railways have been making progress in the maintenance of men. The activities of the Central of Georgia in this regard are described in this issue. Entirely apart from its philanthropic aspects, and viewed solely from a materialistic standpoint, the maintenance of men has proved profitable. The steps taken to care for the physical and mental health of employees have shown immediate and gratifying results in improved morale. This, in turn, has made possible remarkable reductions in accidents, personal injuries and freight claims. The efforts of the Chicago & North Western along similar lines will be described in an early issue. In both cases, it will be seen that the maintenance of men is a profitable field of endeavor, whether the viewpoint is humanitarian or materialistic.

Railways Operate More Motor Coaches and Trucks

FURTHER expansion on a large scale of railway operation of motor coaches and trucks is indicated by early returns in a survey now being made, the results of which will be published in the Motor Transport Section of the *Railway Age* of June 23. It appears that not only are more railways operating motor vehicles on the highways, to supplement or replace their passenger or freight train service, but also the number of such vehicles operated and the aggregate mileage of their routes are much greater than they were a year ago, partly as a result of the increase in

the number of railways operating motor coaches and trucks, but more as the result of the steady expansion of the highway system of those railways which have been engaged in furnishing this form of transportation for several years. While there has been considerable expansion in connection with railway motor truck operation, it seems that the operation of motor coaches by the railways has gone ahead at an even faster pace, perhaps because the passenger traffic situation has been more acute than the freight traffic situation. One railway in the East now has nearly two hundred and fifty motor coaches operating over the highways in its territory. In the middle west another line has motor coach routes aggregating nearly five thousand miles in length. Other railways, which have already reported, have engaged in motor coach operations on similarly large scales. In connection with the operation of motor trucks and tractors and trailers, it appears that the principal development along this line during the past year has been the inauguration of motor service in terminals to replace trap car and similar operations on the rails. The completion of the survey is expected to show that forecasts made a year ago of unprecedented expansion of the railways' highway operations during the subsequent months have been largely fulfilled.

"Let Them Roll!"

THE Boston & Maine on June 5 formally opened its new Boston classification yards with ceremonies probably more elaborate than those heretofore planned for such an occasion. On the top of a hill overlooking the yard a big tent was pitched in which luncheon was served to 1,800 guests—railroad officers, public officials, industrial leaders, prominent shippers. Special trains were provided to take the guests from North Station to the ceremonies. The yard is thoroughly modern—equipped with car retarders, flood lights, power-operated switches, a teletype transmission system, pneumatic tubes, loud speaker phones and hot oil lubricators. Stretched across the hump as a bar to traffic movement was a bunting streamer. President Hannauer, on the hump as master of ceremonies, using the loud speaker phone, received routine acknowledgement from the control towers that all was in readiness. Then he said: "We now dedicate these Boston yards to the service of New England. Let them roll!" Immediately the hump crew sprang to action and the first car, flying the Massachusetts state flag, rolled down to the first retarder, crashing the bunting barrier; and was followed closely by cars flying the colors of the other New England states. Then a whole string of cars in regular service was put over the hump and classified to demonstrate the actual working performance of the modernized yard. Acceleration and economy of terminal operation are important to all railroads; in New England particularly so because of the network of lines and consequent frequency of terminal

handling. Terminal modernization is important to the railroads from a standpoint of economy. It is just as important to the shipper who desires accelerated service. The participation of shippers and industrial leaders in the formal opening of a facility of this character, therefore, is in keeping with its importance to them. No doubt all of them join with president Hannauer and other railroad officers who are modernizing their facilities in the order, "Let them roll!"

"Less Government in Business"

AS an illustration of inconsistency, not only in government, but on the part of business men, high rank must be given to the passage by Congress, with the support and endorsement of many business men, of the bill making an appropriation for trebling the capitalization and enlarging the service of the Inland Waterways Corporation.

"Inland Waterways Corporation" is a stage name under which the government of the United States is doing business. Its ownership and operation of barge lines on inland waterways is simply government ownership and operation. It competes with the railways for business. Its competition with them will now be extended and strengthened. The government also regulates the railways. It dictates not only their rates, but especially the through rates and routing arrangements they must make in connection with its barge service.

Now, surely, under these conditions government ownership and operation of the barge service should be a "success." If the government should fail to make a success of it while not only owning and operating it, but also dictating how the railways must both compete and co-operate with it, then the outcome would certainly be a conclusive demonstration either of the inefficiency of government or of the futility of attempting to revive traffic on inland waterways. Any private concern which, like the government in this case, could conduct its own affairs exactly as it pleased, and at the same time dictate to its competitors how they should conduct theirs, would confidently expect to make a huge success, whether it employed geniuses or half-wits to manage its business.

The government of the United States, and especially the present administration, repeatedly have announced their adherence to the principle that the government should stay out of business and leave it to private enterprise. And it is the government of the United States and the present administration that are now embarking us in government ownership and operation of inland waterways service on an enlarged scale.

At intervals organizations of business men of all kinds, large and small, meet and solemnly adopt resolutions against government interference with business, and especially against every form of government ownership and operation. Nevertheless, there is great rejoicing in business organizations, especially in the Mississippi valley, because government ownership and operation of inland waterway service is to be continued and enlarged. Many of the same newspapers, large and small, in this territory that declaim editorially against government intervention in business, in the very same columns endorse the continuance and extension of government ownership and operation of the barge line service. The legislation in which government ownership and operation of the barge line service originally was authorized set forth that it was an experiment, and if, and when, successful should be turned over to private ownership and management. It has now been tried for

eight years. Is it a success? Within that length of time it would be known whether almost any private venture was a success. The fact that private enterprise has shown no disposition to take it over seems, measured by the test set up by the original legislation, to show it is a failure. Instead, however, of abandoning it the government passes additional legislation to continue and enlarge it. In the new legislation it is again provided that if it is a success it shall be turned over to private ownership and operation. This is emphasized by newspapers and business men that inveigh against government in business in general and government ownership in particular, and enables them to keep straight faces and "kid" themselves and others into the belief that they are consistent.

The barge service is to be turned over to private enterprise only if it is a success; and, of course, private enterprise would not take it over unless apparently it had become or soon could be made a success. But if it became a success it would be difficult to get it turned over to private enterprise because every radical and socialist in the country would strongly oppose the abandonment of government ownership. What is to be done if it is a failure? What evidence will be accepted as showing that it is a failure? Unless past experience may be disregarded, if it is a failure, as measured by what it costs the taxpayers, but at the same time carries freight at lower rates than the railways can afford to make, all the business interests in the Mississippi valley that profess to be opposed to socialistic enterprises in general will nevertheless insist that the government stay in the barge line business and continue to carry their freight largely at the expense of the general taxpayer. In other words, regardless of the actual results it will be difficult if not impossible ever to get the government out of the barge line business.

Meantime, nobody excepting railway officers apparently cares a hoot about the effects of this combination of government regulation of the railways and government competition with the railways upon railway earnings and service. Almost all business men are opposed to government ownership of railways; but almost all of them look with favor upon government competition, and government subsidizing of a competition, with the railways. They agree that good and adequate railway service is essential to the public welfare, and that in order to render such service the railways need to earn a fair return; but they are keenly in favor, also, of government regulation and competition to reduce rates and divert traffic from the railways, which, of course, tends to make it difficult or impossible for the railways to earn the aforesaid fair return.

In other words, in respect to transportation many business men favor in particular cases everything to which they profess to be opposed on general principles, and advocate every measure they believe will promote their own selfish interests, regardless of the ruinous effects it tends to have upon the railway service any prospective deterioration of which they deplore and view with alarm. When in future radicals and socialists advocate more government in business, and business men denounce them for favoring unsound and destructive principles, the radicals and socialists will need only to point to the attitude of business men toward government ownership and operation of the barge line to show that the only kind of socialism to which most business men actually are opposed is socialism applied to their own particular businesses. Offer the average business man almost any socialistic enterprise that he believes will increase his own profits, and he will vote for it, let the

losses fall where they may. Having done so, he will fare forth and wisely and self-righteously denounce socialistic principles and practices, abuse incompetent public officials and demagogues for increasing taxes, publicly thank God that the Scribes and Pharisees of American business are not like other men, and proclaim that what we need is more business in government and less government in business!

Railroad Equipment Declining

THE railroads recently have been handling their traffic not only with fewer employees than at any time within six years, or since 1922, but also with fewer locomotives owned by them than in more than fifteen years, or since 1912, and fewer cars owned by them than in more than four years, or since 1923. This feat is being accomplished with more locomotives stored in serviceable condition than in seven years, or since the middle of 1921, and with larger surpluses of freight cars being reported than since 1925. There has been, however, thus far in 1928 a steady decline in the number of surplus freight cars, whereas in the early part of 1925 the number was increasing. At the beginning of the present year the total number of surplus freight cars was almost 462,000, while the latest number reported was 299,629.

The maximum number of locomotives reported as owned by the Class I roads at the end of any year was at the end of 1924 and amounted to 65,358. Since then the number retired from service has so exceeded the number installed that the number now owned is only about 61,000. The locomotives installed have been of greater tractive capacity than those retired, and the aggregate tractive power of all locomotives, increased until it reached the highest point in history in May, 1927, when it exceeded 2,616,000,000 pounds. Since then the number of locomotives retired has so greatly exceeded the number installed that the aggregate tractive power of all locomotives has been steadily declining, and when last reported in April was smaller than at any time since February, 1926, and also smaller than as long ago as in August, 1925.

The number of freight cars owned by the Class I roads as far back as 1919 exceeded 2,361,000. It declined until 1922, and then increased to 2,357,234 at the end of 1925. It is now only about 2,317,000. The capacity of the cars installed also is larger than that of those retired, and the aggregate capacity of all freight cars increased until it reached a maximum exceeding 106,000,000 tons in October, 1927. Since then the number of cars retired has so greatly exceeded the number installed that the aggregate capacity of freight cars is now only about 105,000,000 tons, or less than at any time since June, 1925.

There was never a year from 1890 to 1914 when the total number of locomotives in service did not increase, and there were only two years from 1890 to 1915 when there were small declines in the number of freight cars in service. Throughout this period the increases in the aggregate capacity of locomotives and cars were practically unbroken because of increases in both their total numbers and in their average capacity. The ability of the railways within recent years to handle traffic more satisfactorily than ever before, without such large increases in the number and aggregate capacity of locomotives and cars as formerly occurred, has been due to various causes. There has been an actual decline in total railway mileage since 1916 and, therefore, no new mileage for which to provide equipment as there was

before; but in 1923, 1925, 1926 and 1927 the total freight business handled was larger than in any year previous to 1923, and the success with which it was handled without any corresponding increase in equipment was due to improvements in all facilities and in methods of operation.

The recent declines not only in the numbers of locomotives and cars, but also in their aggregate tractive power and capacity, are unprecedented. Can the railways go on rendering such freight service as at present with the aggregate power of their locomotives and carrying capacity of their cars actually decreasing?

Railway stocks recently have been selling at the highest prices in history, but railroad development always has been influenced much more by earnings than stock market prices. It is significant that the recent declines in the total tractive power of locomotives and carrying capacity of freight cars have synchronized closely with the decline in the net return earned. The decline last year in the net operating income earned by the Class I roads began in April. The first decline in the total tractive power of locomotives was reported in June, and the first decline in the aggregate capacity of freight cars in November. During the last twelve months for which complete statistics are available the railways earned a smaller average percentage upon their property investment than in twenty of the last twenty-four years of private operation. In the railroad as in every other business retrenchment in the investment of capital and in maintenance expenditures usually occurs when the net return earned declines.

Politicians, labor leaders, business men and farmers who are disposed to seek advances in wages and reductions of rates, regardless of the effects on the net return earned by the railroads, might well pay less attention to stock market prices and more to current tendencies in the railroad industry that are of fundamental importance. Railway service is now better than ever before, but it is plain to every student of railway affairs that prevailing tendencies in the industry are strongly inimical to indefinite maintenance of present service. The current performance of the railways is highly creditable to their managements, but in the long run their performance always has been and always will be determined mainly by the return earned upon their investment.

Heat Radiation Losses

IF the steam generating capacity of a locomotive boiler is increased, the tonnage that the locomotive can haul will be advanced in like manner. If three per cent of the steam, or its equivalent, heat, is saved, then the locomotive will handle more cars without added expenditure for fuel or cost for labor. The saving is obvious. While much effort has been made to insulate the cylinders and valve chambers of locomotives, it is doubtful whether this is being done as effectively as it might be. The valve chamber and cylinder head casings, for example, consist of pressed steel coverings which bear against the cylinder casting itself, and thus become the means of communicating heat directly from the latter to the outside. Those steam pipes which are contained in and form a portion of the cylinder saddle and cylinders are in direct communication with the external air. Often the steam supply passages approach closely to the surface of the casting without any protection at all. In this way there is a heat loss at the very last moment before the steam, generated by the boiler and dried by the super-

heater, is used, with the result that an unnecessary lowering of temperature and a direct loss occurs. The difficulties of having steam free from moisture when it enters the cylinders to do productive work, or in fact when it is supplied from the locomotive boiler for any purpose whatsoever, are too great to justify permitting the heat to escape right at the point of use. While it is true that the generation of steam in a locomotive boiler is so extremely rapid that a given amount of loss by radiation forms a smaller relative proportion of the total output of the boiler than in stationary plants, it is also true that the boiler, cylinders and steam pipes of locomotives are much more exposed to loss of heat than in any other class of steam service. The fact that such loss is entirely invisible and intangible makes it much more difficult to give it the detailed attention and study that it deserves. If a locomotive should pass three per cent of its fuel out of the gangway and scatter it along the right-of-way as it went over the division it would not take long to arouse the interest and co-operation of everyone to stop the loss. A careful check of all locomotive heat radiation losses with a view to developing ways of eliminating them insofar as practicable would doubtless prove illuminating and beneficial.

Pension Plans and Accrued Liability

APPARENTLY the discussion of the pension problem carried on in these columns has attracted attention beyond the group that has more or less specialized on its consideration. A reader, obviously not in an official capacity, after expressing deep interest in the discussion, suggests that we pause long enough to outline a little more fully those factors which enter into what has been designated as accrued liability.

As indicated in earlier editorials, the pension costs are dependent upon several factors, important among which are the age of retirement and the basis upon which the pension allowance is calculated. These factors are also equally important in estimating the accrued liability. If a pension plan is inaugurated when an organization is first formed, it will of course start off with a clean slate. In actual practice, however, organizations sometimes run along for many years without a thought of a pension plan. Employees who become disabled or who retire because of age are few in number and are either neglected or are taken care of by special grants at the discretion of the board of directors. The time comes, however, in many organizations, when the number of disabled or aged employees increases greatly. The problem of making special provision for each employee who is considered for retirement becomes a burdensome one and certain rules and regulations are set up to simplify the practice. The next step follows naturally and logically—advancing from a purely discretionary arrangement to a formal pension plan. This has taken a simple form on the railroads, the pension allowances ordinarily being based upon a certain percentage of the average compensation earned during the ten years immediately preceding retirement, multiplied by the number of years of actual service.

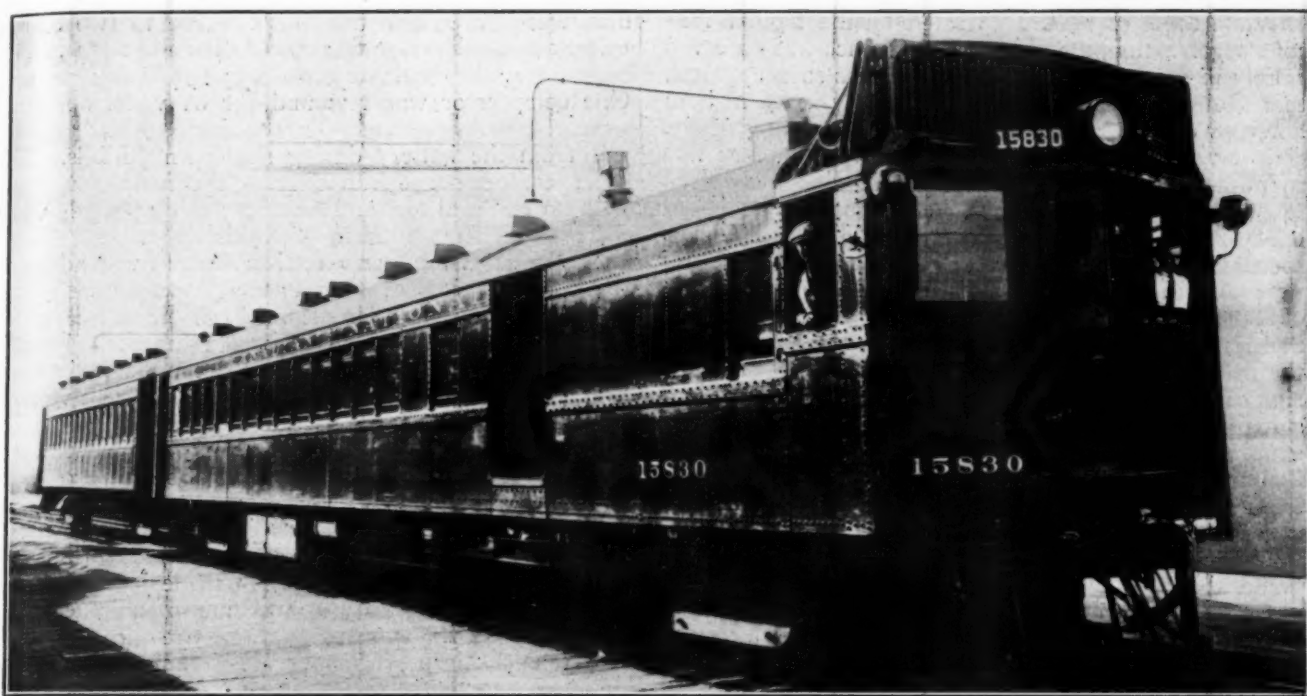
The moment that a formal pension plan of this sort is set up, a heavy accrued liability is shouldered, although the extent of this liability has apparently seldom been clearly recognized. All of the employees, for instance, immediately become potential pensioners. Some of them may have been many years in the service and

due to retire in a few months, or a few years. Even those who have been only a short time in service may remain with the company and draw pensions many years hence, which will be based, in part, upon the time that they have already served. Of course, not all of the employees will remain with the company or live until the age of retirement. In all probability, a larger percentage of the skilled and higher paid employees will remain in the service, than of the unskilled and lower paid workers. For this reason it will be necessary to make check-ups of the previous experience of the company, or of other similar organizations, and actuaries must be retained who understand how to use this experience and are also familiar with data as to life expectancy and matters of that sort. They can determine with a reasonable degree of accuracy about what percentage of the employees will remain in the service of the company until retirement and the average length of time they will be paid pensions. Certain allowances, however, must be made for possibilities of greater life expectancy, or reduced turnover because of greater stability of employment, or improved methods of training and handling the personnel, or other factors.

Having some idea of the number of present employees that may remain in service until retirement, it becomes possible for the actuaries to determine roughly how much money will eventually have to be paid out in pensions to the employees in the service at a given time; they can also calculate how much of this amount is chargeable to service rendered up to that time. This latter figure is known as the accrued liability.

The basis upon which pension plans have been established in many organizations outside of the railroad and industrial field is first to establish a fund which will cover the accrued liability to date and then arrange for the regular payment to this fund from week to week or month to month, or year to year, of amounts to cover the current liabilities calculated on an actuarial basis. As pointed out in an earlier editorial, the practice of the railroads in basing the pension on the average wage for the last ten years of service, makes it a difficult problem to estimate either the accrued liability or final pension costs with any degree of accuracy. On the other hand, when a pension is based on the average compensation received per year for the entire time of service, it becomes possible to estimate the accrued liability much more closely; it is for this reason apparently that the English railroads favor that practice in making pension allowances.

If, in establishing a pension plan, a fund or reserve is set up covering the accrued liability, and if the pension allowances are paid from this fund, and the fund, on the other hand, is periodically augmented by amounts covering the current liabilities as estimated by the actuaries, the interests of the pensioners are fully protected and some provision is made for prospective pensioners, to the extent of the length of time they have been in service, if the company is absorbed or should go out of business. If, on the other hand, no provision of this sort is made and the pensions are paid from current revenues, the entire burden of taking care of the pensioners is passed on to the future. Also, the rights of the pensioners and prospective pensioners are not protected in case of consolidations or financial adversity. The seriousness of passing this burden on to the future is emphasized in a communication from J. C. Clark on funding pension plans which will be found on another page. Is it not good business to spread the pension burden more evenly over the life of an organization than is the case where an adequate pension fund or reserve is not set up, and where the pension payments are largely made from current revenues?



Canadian National Oil-Electric Car and Trailer Powered with Six-Cylinder, 300-Horsepower Engine

Oil-Electric Motive Power on the Canadian National

The influence of three years operating experience on the development of cars and locomotives driven by internal combustion engines

By C. E. Brooks

Chief of Motive Power, Canadian National Railways

IT has been several years since the Canadian National Railways recognized the necessity of substituting a new type of equipment in train service then operated by steam at little or no profit on lines where service was comparatively light. An exhaustive study was made of all existing types of motive power, both on this continent and abroad, and it was found that a self-propelled car, using an internal combustion engine as the source of power, showed the most promise. It was further found that the oil engine offered the most promising solution for the power plant because of its higher thermal efficiency, lower fuel cost, minimum fire hazard, ease of handling and storing of fuel oil, and comparative safety with which a supply of fuel oil can be carried on a passenger car.

The oil engine had proven its merits in other classes of service, such as marine propulsion, power plants, and isolated pumping stations, but the investigation showed that the weight and size of standard engines of this type of required power, was such as to prohibit its economical application to a rail car, where both of these items are of prime importance.

On further investigation it was found that a light weight, high-speed oil engine had been developed by the Wm. Beardmore Co., Ltd. of Glasgow for the British Air Ministry. By careful design and scientific use of materials, the Beardmore engineers reduced the weight

in pounds per horse power to a point heretofore considered impossible, with a corresponding reduction in size.

The development of this oil engine for rail car service was accordingly undertaken by the Wm. Beardmore Co. with the result that in September, 1925, the Canadian National Railways placed the first cars in service, equipping two articulated type cars and seven single unit cars with this type of engine.

After three years and the completion of approximately one million five hundred thousand motor car miles, it is believed that a brief review of operating experience and development of this type of equipment will be of interest.

Cars Equipped with Four- and Eight-Cylinder Engines

The articulated type car is 102 ft. long, weighs 94 tons and is equipped with a Beardmore eight-cylinder oil engine rated initially 320 b.hp. at 600 r.p.m., weighing 14.5 lb. per b.hp. without flywheel or bedplate, and 21.5 lb. per b.hp. with these parts.

The single unit type of car is 60 ft. long, weighs 51 tons, and is equipped with a Beardmore four-cylinder oil engine, rated initially 185 b.hp. at 700 r.p.m., weighing 14.2 lb. per b.hp. without flywheel or bedplate, and 27.5 lb. per b.hp. with these parts.

While these cars were operated by the regular railroad organization, the engine performance was observed closely in service and on test, and it was soon apparent that the engines were too conservatively rated in both horsepower and speed. Accordingly, the rating of the eight-cylinder engine was raised to 400 b.hp. at 700 r.p.m. and that of the four-cylinder engine was raised to 200 b.hp. at 750 r.p.m. At the present writing, based on later experience, it may be stated that still higher speeds with a corresponding increase in rating are practical when properly provided for.

Many interesting experiments were tried out during the first year of service, all with the view of attaining the necessary experience to determine the ultimate design of engines, electrical equipment and car bodies best suited to meet the exacting railroad conditions from the standpoint of operation and personnel. The equipment had to be as simple as possible, reliable, and to lend itself to the regular routine maintenance found on the average steam railroad, as far as practicable.

A number of major changes were made in the car bodies during this time such as seating arrangement, location of toilets, bulkheads, etc. Trailer operation was introduced and several light weight trailers were built to conform with the rail car, giving the whole train a symmetrical appearance and a greater public appeal.

Control

Two types of electrical control were used. The four-cylinder engines were operated as variable speed engines with an operating range from 300 r.p.m. idling to 750 r.p.m. maximum through a manually controlled connection to a relay type of governor. The motor connections are made through a K type controller with the three positions, series, parallel and shunt. To obtain the desired car speed, it is necessary to accelerate the oil engine through its speed range on each of the controller positions.

The eight-cylinder engines were operated at constant speed under load, using the generator field for varying the car speed. During no-load periods the engine idles at 575-600 r.p.m. The traction motors were connected permanently in parallel.

Experience showed that some means should be provided to prevent the overloading and possible stalling of the engine under conditions of improper controller operation on heavy grades and loads. It was found that with the differential field system of limiting electrical load to engine capacity over the speed tractive effort range of traction motors, that the generator did not load the engine completely at the lower and higher car speeds. This resulted in lower accelerating rates from standstill, and lower maximum speeds at which full engine horsepower could be utilized.

Further, the differential field system resulted in loading the engine to full torque at rated engine speed only, the torque falling off rapidly at reduced speeds, whereas all internal combustion engines operate most efficiently when loaded to full torque throughout the full range of speed.

The four-cylinder cars were equipped with 600-volt air compressors, operating from the main generator only, necessitating full speed on the oil engine to get full air compressor capacity. A 60-cell, 120-volt battery was provided for engine starting.

The eight-cylinder cars were equipped with two 300-volt compressors and a 150-cell, 300-volt battery for engine starting and compressor operation. This battery was charged from the main generator through an external charging resistor during load periods. The 300-volt battery was found to be of much greater capacity

than was needed and this was reduced to two 32-cell 64-volt batteries, removing 86 cells from each car. This battery is now charged during engine idling periods. One compressor was rewound for 64 volts, operating from the main generator during engine idling periods and from the battery during shutdown periods. The other compressor operates from the main generator, with an external resistor in series during periods when the main generator voltage exceeds 300 volts.

At the same time, an electrical feature was added to the control which is known as the Westinghouse torque governor. This is a simple and reliable device which operates as an automatic external regulator. By this means the main generator torque can be maintained practically constant over the operating range of voltage, independently of engine speed, thus keeping the engine operating at approximately full torque at all speeds.

Details of the first year's operation of these oil electric cars were published in the *Railway Age* issue of June 4, 1927. One of these cars operating between Pembroke and Ottawa has made over 115,000 miles to date, of which 50,825 miles were made in 1927, when a total of only 12 days were lost due to equipment, and this time was for wheel changes or tire turning. This is a remarkable performance for a comparatively new development.

Cars Equipped with Six-Cylinder Engines

A review of the average application of these equipments brought out the fact that a 300-hp. engine would cover branch line or light main line service better where a trailer is to be handled, and from the experience obtained from these first equipments, a six-cylinder, 300-b.hp. 800 r.p.m. engine was designed and built by the Wm. Beardmore Co. These engines were installed on cars 73 ft. 9 in. long, weighing 70 tons when fully equipped. Five cars of this type were placed in service in 1927.

Although it was contemplated originally that these cars would not pull more than one light weight trailer, it was found after service tests that they would handle larger trailing loads at existing schedule speeds and in some instances they have been loaded accordingly.

All previous experience was capitalized and embodied where desirable in these cars. It was found that maximum engine horsepower output is used for a comparatively small part of the time in average service, so variable speed governing the engine was adopted with torque governor control. This permits operating the oil engine at the minimum speed necessary for a given schedule, conserving the engine and minimizing fuel and lubricating oil consumption.

The variable speed governor takes the operation of the engine throttle out of the hands of the engineman except to set the single engineman's control lever in position to correspond to the engine speed necessary to give the car speed desired. The control was simplified as much as possible using a Westinghouse type XM-20 controller with only one control lever to govern the engine speed and at the same time make all electrical connections.

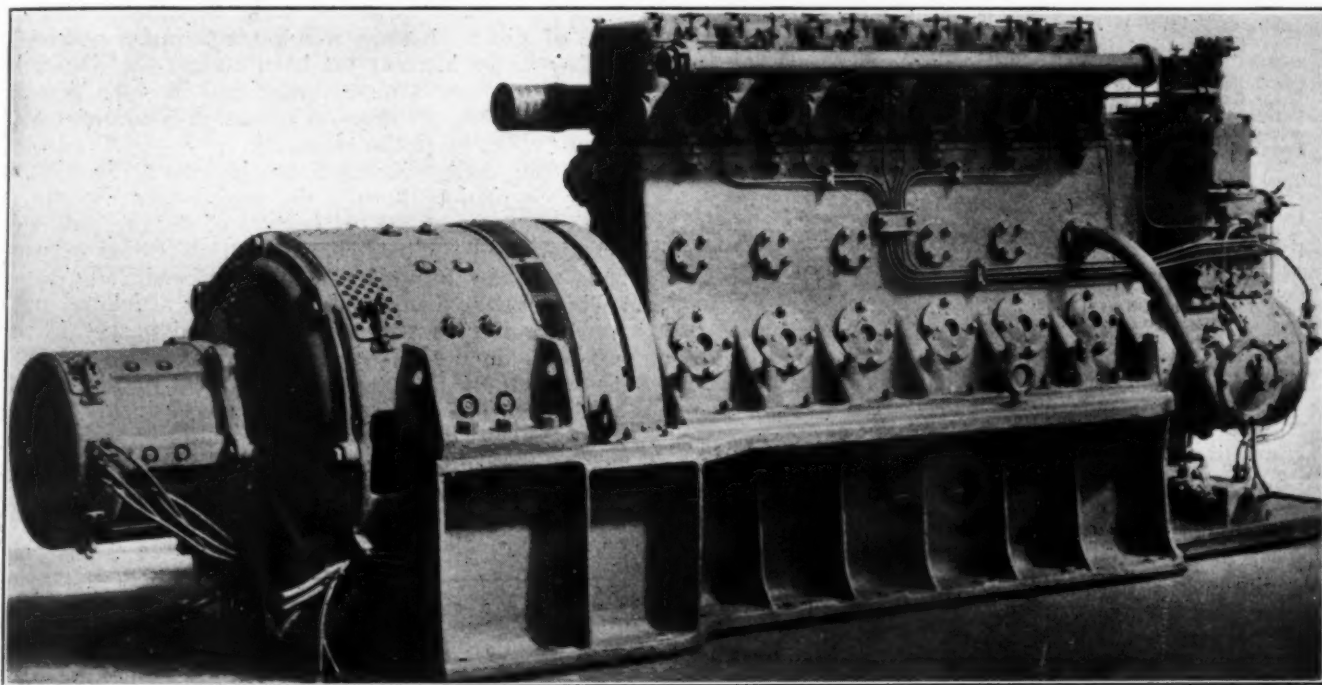
The differential winding is eliminated and a practically constant voltage auxiliary generator, generating 64 volts, is used in place of the exciter. This allows the use of a 64-volt battery for starting the engine and 64-volt air compressor. The air compressor and battery charge are taken off the auxiliary generator during load periods and off the main generator during idling periods. This change over is made automatically and is entirely out of the hands of the operator.

Cars are Scattered Over Canada

In all, 14 of these oil-electric car equipments are in service on the Canadian National system, operating over a total of 23,000 route miles in climates ranging from hot summer weather to winter temperatures of from 50 to 60 deg. below zero in the northern regions. The cars are scattered throughout Canada, from Prince Edward Island in the Gulf of St. Lawrence in the east to Alberta and Saskatchewan in the west, far removed from central headquarters and any considerable supply of renewal parts. These cars were given to the regular organizations to operate, to steam engineers who received this new type of equipment with some doubt, but who in most cases now prefer them to steam locomotives, and to maintainers who had to be taught the equipment's operation from the ground up—and it is a credit to the fundamental design of the car and its equipment,

ures of the engine are its light weight and high speed, attained partly by careful design and partly through the scientific use of materials. Aluminum alloy is used for the cylinder heads and pistons and front-end casings. The cylinder liners are machined from seamless steel tubing which eliminates all excess material from the cylinder block and crankcase.

During the earlier stages of operation, some troubles were experienced with the fuel injection system, which caused excessive wear in the fuel pump and clogged atomizers. Various types of fuel oil filters were tried with varying degrees of success. A 120-mesh screen was finally installed in the oil feed line with the result that an average of 50,000 car miles is obtained before the fuel pumps require any attention. In one instance, a car has operated 115,000 miles without any replacements of worn parts or repairs to the fuel pump, or



Westinghouse-Beardmore Oil Engine Built at the South Philadelphia Works of the Westinghouse Electric & Manufacturing Company

that under all these trying conditions, the cars ran and proved the economic advantage of the oil burning internal combustion engine over other types of motor power available.

Some of these cars make scheduled runs of over 300 miles per day, hauling trailers. Two of the six-cylinder cars operate 342 miles each, daily, between Edmonton, Alberta and Saskatoon, Saskatchewan, running in opposite directions, and each pulling a 30-ton trailer and 60-ton standard baggage car on these runs.

Effect of Experience on Design

As the oil engine is the heart of the power plant, it will be worthwhile to review in detail some of the problems encountered with the engines, and how they have been solved. Of course, many of the troubles that have occurred are chargeable to unfamiliarity of the operating and maintenance organization with this new equipment and its requirements and not to fundamental defects in the equipment itself.

The Beardmore oil engine is of the modified Diesel, four-stroke-cycle, solid-injection type. Its design follows along conventional lines. The outstanding feat-

signs of falling off in pump efficiency.

There has been only one case of crankshaft breakage and that occurred on a four-cylinder engine. A thorough analysis of this proved conclusively that it was due to a flaw in the material.

The main crankshaft bearings have operated successfully throughout without any trouble whatever. The four and eight-cylinder engines were equipped with bronze shells, babbitted on the bearing surface. The six-cylinder engines were equipped with steel shells, babbitted on the bearing surfaces. The small end bearings of all engines are of the same design, using a floating steel wrist pin with a bronze bushing in the rod, and no bushing in the aluminum piston. The wear on these parts is negligible.

The big end connecting rod bearings of the four and eight-cylinder engines were fitted with bronze shells, babbitted lined. After 75,000 car miles of operation, it was found that the babbitted lining was cracking and flaking off, probably due to flexing of the shell. In an effort to improve this, the six-cylinder engines were fitted with steel shells, babbitted lined. This did not prove as good as the bronze shells, as trouble was experienced

with the babbitt flaking off at lower car mileage due to lesser adherence of the babbitt to steel, with the added disadvantage of scoring the crankpin in two cases, when it came in contact with the steel shell. This did not occur with the bronze shell. Special alloy bronze shells without babbitt lining are now in service on some cars, which, after some initial modifications, have proven satisfactory to date, although bronze shells, babbitt lined, are still in use on the majority of the engines.

The big ends of the connecting rods of the four and eight-cylinder engines were fitted with four $\frac{1}{2}$ in. bolts, 16 threads per inch, Whitworth type, while the six-cylinder engines were fitted with two $\frac{3}{8}$ in. bolts, eight threads per inch, U. S. Standard, with castle nuts and cotters on all types. The latter design did not prove as good as the former, as there have been two cases of bolts breaking, probably due to poor assembly on ac-

been found that it may be governed by piston design and clearances between piston and liner and the maintenance of the proper temperatures of cooling water and lubricating oil under the varying load conditions of rail car service. Pistons and liners are designed to give the proper clearances at full load and temperatures existing at that load, and excessively low temperatures of cooling water, caused by lack of temperature control of the cooling system, permit the piston to contract to a point where the increased clearances result in lubricating oil passing the piston to the compression rings, carbonizing underneath them, causing additional wear, and eventually passing to the combustion chamber. This has been conclusively demonstrated by the experience developed with the different types of equipment in service with the various arrangements of radiators for cooling the water and oil, and both existing and new equipments are being modified to correct these conditions.

On equipments provided with oil coolers, and one type of piston, but on which temperature control of cooling water has not yet been added, the lubricating oil consumption is much lower and in some cases as much as 75,000 car miles of operation is obtained without a change of piston rings.

On the earlier installations, improper direction of water circulation through the engine was directly responsible for a number of failures of the cast aluminum cylinder heads. Since changing the direction of water flow, the only failures to date have been those on one engine due to overheating caused by a failure in the water cooling system. Cylinder head gasket leakage has been eliminated by the use of an annealed solid copper gasket and the proper arrangement of the cylinder head bolts. The details of the valve mechanism of the engines differed materially and adequate means for maintaining clearance were not provided on either type. This condition, with insufficient lubrication, resulted in noise and affected the general operation. This has been overcome by providing a screw adjustment and the addition of

Summary of Performance—Year 1927

	6-Cyl. 300-Hp. Oil-Electric		4-Cyl. 200-Hp. Oil-Electric	
Car Number	15,829	15,830	15,819	15,823
Motor Car Miles	33,314	23,601	62,846	44,054
Trailer Miles	61,120	11,292	60,883	22,464
Average Daily Mileage	342	281	228	170
Days out of Service—Equipment	4	14	20	46
Days out of Service—Trans. Dept	32	5	17	22
Total Scheduled Days	133	103	313	313
Complete Failures	—	1	5	—
Delays	1	1	14	19
Minutes Delayed	30	35	487	432
Gals. Fuel oil used	11,627	6,387	18,207	11,187
1,000 Ton-Miles	6,665	2,151	4,730	2,901
Average Miles per Gal. Fuel Oil	2.86	3.70	3.45	3.94
Gals. per 1,000 ton-miles, fuel	1.74	2.97	3.85	3.85
Gals. Lubricating Oil used	1,245	460	1,286	735
Average Miles per Gal.	26.78	51.30	48.86	60.00
Gals. per 1,000 ton Mi. Lub. oil	.1867	.2138	.2718	.2533
Operating Efficiency (Availability)	96%	86%	93%	85%
Total Previous Mileage to Jan. 1, 1927			60,191	41,488

count of the coarser thread, allowing the nuts to back off. Engines built in the future will be fitted with four $\frac{3}{4}$ in. bolts having S.A.E. standard threads.

Periodic examination of cylinder liners indicates a wear of about .010 in. on the four and eight-cylinder engines after 100,000 car miles of operation, and a somewhat greater wear on the liners of the six-cylinder engines, although it is difficult to determine if this is all wear or partly due to cylinder liners being slightly out of round. The indications are that the increased wear on the six-cylinder engine liners is due to lubricating oil carbonizing behind the piston rings. A change in piston design from that used on the four and eight-cylinder engines permits greater freedom for the lubricating oil to reach the rings. This condition is being compensated for in engines now being built by slight modifications in piston design, proper seasoning of material, and the addition of provisions for maintaining uniform operating temperatures.

Sticking exhaust valves was considered to be a problem in the early stages of operation but this is now reduced to a negligible quantity by the use of the proper materials in valve stem, valve stem guides and the proper design of entrance to the combustion chamber.

Two types of aluminum pistons were used in the engines, one type being a single piece piston with an oil scraper ring at the bottom, the other being a two-piece piston with a long skirt but without a scraper ring at the bottom. Any troubles experienced have been traceable directly to a definite cause, such as improper fitting, overheating due to lack of water circulation or lack of lubrication due to failure of auxiliary apparatus external to the engine.

Lubrication

An intensive study has been made of the consumption of lubricating oil in this class of service. It has

Statistics & Costs of Oil-Electric Rail Car Operation Year 1927

	6-Cyl. 300-Hp. Oil-Electrics		4-Cyl. 200-Hp. Oil-Electrics	
Car Number	15,829	15,830	15,819	15,823
Expenses				
Supervision Acct. 301		\$585.09	\$1,294.83	\$1,080.00
Car Repairs Acct. 317	\$632.98	345.63	3,051.14	1,175.64
Motor Repairs Acct. 320	1,926.57	2,341.38	7,694.67	4,279.06
Totals	\$2,559.55	\$3,272.10	\$12,040.64	\$5,454.70
Transportation				
Wages of Motormen Acct. 393	\$2,302.99	\$1,252.54	\$4,697.64	\$3,780.10
Wages of Trainmen Acct. 401	2,415.09	1,387.09	6,540.27	4,849.38
Fuel Oil	1,242.69	481.02	2,193.55	1,727.89
Lubricant	1,156.80	238.27	1,240.67	483.66
Other Supplies	1,519.05	623.22	1,491.17	290.36
Totals	\$8,636.62	\$3,982.14	\$16,163.90	\$11,131.38
Total Expenses	\$11,196.17	\$7,254.24	\$28,204.54	\$16,586.08
Statistics				
Motor Car Miles	33,314	23,601	62,846	44,054
Trailer Miles	61,120	11,292	60,883	22,464
Average Daily Mileage	342	281	228	170
No. of Men in Crew	3	2	3	3
Car Repairs per motor car mi. c.	1.92	1.46	4.85	2.66
Motor Repairs per motor car mi. c.	5.87	9.92	12.24	9.71
Supervision per motor car mi. c.	—	2.47	2.06	—
Fuel per motor car mi. c.	3.78	2.03	3.49	3.92
Lubricants per motor car mi. c.	3.52	.95	1.97	1.09
Cost per Motor Car Mile c.	34.12	29.73	44.87	37.64

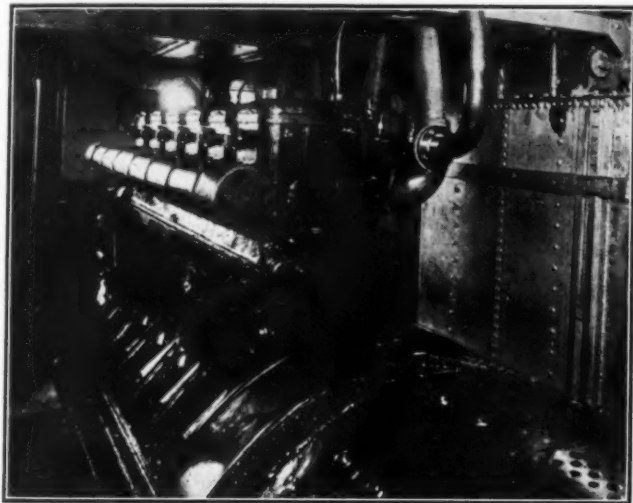
provisions for forced lubrication. These features have been added to some of the engines, and are being applied

to the remainder of the engines as rapidly as possible. The engine governors have functioned perfectly without repairs except in the case of the eight-cylinder engines where a new spring was developed on account of breakage.

Forced feed lubrication by a gear pump is used throughout on all engines, with excellent results. The six-cylinder engines are now being equipped with a duplex type gear pump, one side of which is used for the forced feed system, and the other side for forcing the oil through a cooling radiator, being made to conform with the four and eight-cylinder engines in this respect.

Various types of lubricating oil cleaners have been tested, the best results being obtained from the basket type of filter. A broad study of the auxiliary engine cooling system, as regards quantity of water carried, rates of circulation, radiator arrangement and protection in low temperatures, temperature control for initial warming up and maintenance of uniform operating temperatures, has established the importance of these features and blazed a trail for future guidance where the way was unmarked on the initial installations.

The entire problem of building and applying oil engines to rail cars for the Canadian National Railways has been one of pioneering and in retrospect after three



One of the Six-Cylinder Units Installed in a Car

years operation, the difficulties experienced have not been due to fundamental defects but rather to lack of experience in perfection of detail for railroad operation.

As a whole, the equipments are operating with increased satisfaction after three years service, so that

more stabilized. Experience will pyramid as more equipment of this type is added to the system and the costs of operation will be reduced.

It must also be remembered that nine of these cars were included in the original purchase and when experience dictated a change on one car, it had to be carried through on the other eight. This naturally increased operating expenses materially but in the opinion of the railroad accelerated the whole development. However, even under these conditions, the cars have shown a large saving over the comparable steam operation and this has been as high as 75 per cent in some instances.

Some of the typical operating statistics and costs will be of interest. They include all charges due to development, changes, repairs, etc., and the figures tabulated are on the basis of Imperial gallons and fuel and lubricating costs obtaining in Canada. The latter averages 12-cents a gallon for fuel oil and 80-cents a gallon for lubricating oil. Converted to an American basis, with fuel oil averaging five cents per U. S. gallon, the fuel costs will be less than two cents (\$.02) per motor car mile.

Some outstanding performances have been made with these oil-electric cars. In November, 1925, one of the 200-hp. cars made a record-breaking trip from Montreal to Vancouver, B. C., in 67 hours actual running time. The engine was kept running the entire distance of 2937-miles. Last August, one of the 300-hp. cars made a scheduled 60 miles an hour run from Montreal to Toronto, a distance of 326 miles with four stops in 5 hr. 40 min., total elapsed time. Two extra stops were made due to block.

Recently the power in the 3.1-mile electrified Mount Royal tunnel at Montreal failed and one of the 300-hp. oil electric cars was pressed into service and handled all the through traffic and suburban traffic through the tunnel for 10 hours without excessive delays or loss of time. It handled two standard coaches up the .6 per cent grade, and four standard coaches on the level. This service is normally handled by 166-ton electric locomotives with a continuous rating of 1090 hp.

A 2,500-Horse Power, Oil-Electric Locomotive

The next step in the development of the oil-electric equipment is the large road locomotive. A locomotive of 2500 hp. nominal rating is being assembled at the plant of the Canadian Locomotive Company at Kingston, Ontario, for the Canadian National Railways. The oil engines for this locomotive were designed and built by the William Beardmore Company, the mechanical parts are the joint design of the Canadian National Railways, Westinghouse, Baldwin and Commonwealth Steel

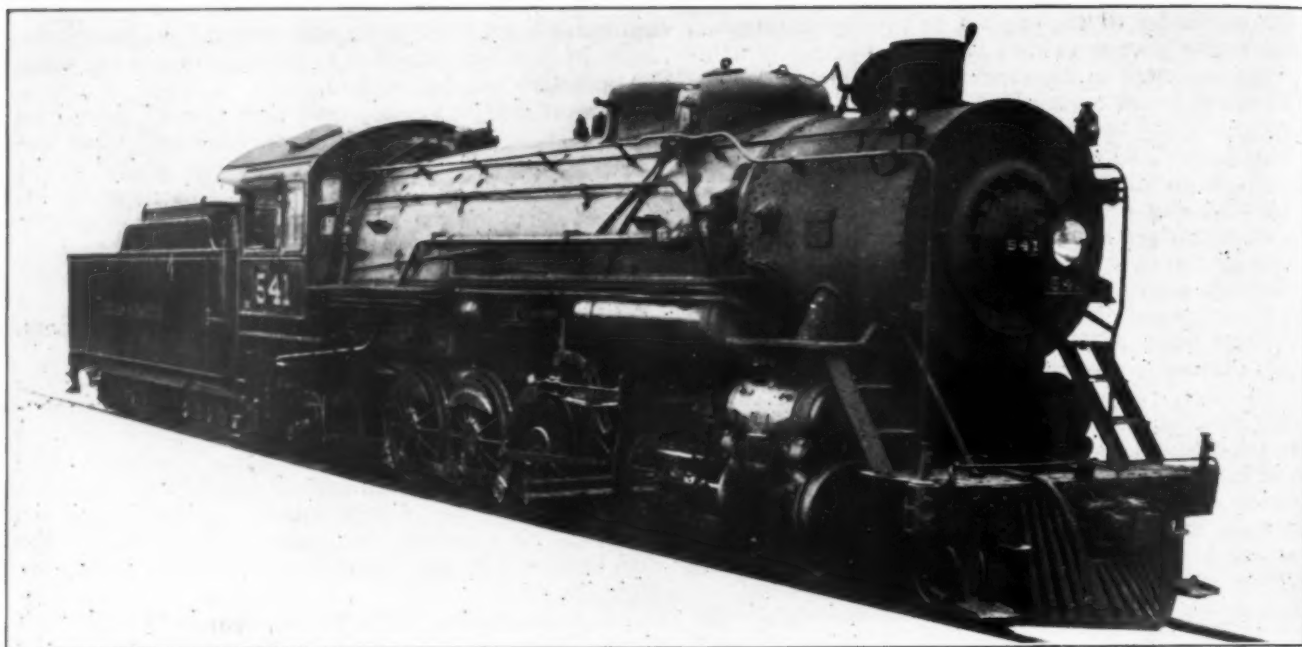
Data on Typical Runs

Car No.	Hp.	Length of Car	Weight of Car	From	Operates — To	Daily Mileage	Total Mi. to date Apr. 1, 1928	Remarks
15,829	300	73 ft. 9 in.	70 tons		Edmonton-Saskatoon	342	52,792	Hauls one 30-ton passenger trailer and one 60-ton baggage car
15,830	300	73 ft. 9 in.	70 tons		Hamilton-Toronto-London-Hamilton	281	44,195	Hauls one 30-ton passenger trailer and one 60-ton mail car for half the trip
15,819	200	60 ft.	52 tons		Quebec-Sherbrooke	228	131,183	Hauls one 30-ton trailer all the time
15,823	200	60 ft.	52 tons		Moncton-Springhill Jct.	170	96,176	Hauls one 30-ton trailer for half the trip
15,825	200	60 ft.	52 tons		Pembroke-Ottawa	168	114,925	Does not haul a trailer

it has just been decided to apply the only spare four-cylinder engine generator set, purchased with the first equipments and held in readiness for use, on another 60-foot car, being built for that purpose.

The railroad organization has become more familiar with the requirements of rail car service and the equipment, with the result that the operation has become

Company. The electrical transmission and control equipment were designed and built by the Westinghouse Company. It will be a two cab, articulated type locomotive with a wheel arrangement 4-8-2 + 2-8-4. The locomotive length is 94 ft. 1 in. over-all. It weighs approximately 320 tons, and will develop a tractive effort of 125,000 lb.



Texas & Pacific 2-10-2 Type Locomotive Equipped with Martin Water-circulating Tables.

T. & P. Tests Special Firebox for Oil-Burning Locomotives

Comparative test runs with locomotive equipped with standard firebox shows nine per cent fuel saving

IN January of this year, the Texas & Pacific conducted a series of four tests with a locomotive equipped with Martin water circulating and steam generating tables, developed by the Locomotive Boiler Economizer Company, Roosevelt Building, Los Angeles, Cal. At the same time these tests were run, a series of four similar tests with a locomotive equipped with a firebox of standard construction were also made for purposes of comparison. Both locomotives were of the 2-10-2 type. The Martin tables were installed in September, 1927, which makes a total period of practically nine months that they have been in service.

The 2-10-2 type locomotive, No. 541, which was equipped with the Martin tables, has been operated in pooled freight service over different divisions during that period to ascertain its performance with a variety of boiler feed water. The comparative tests made last

ever, the railroad reports that a fuel saving of 11.2 per cent per 1,000 adjusted gross ton-miles was accomplished with locomotive No. 541, and it evaporated 14 per cent more water per pound of fuel oil than locomotive No. 534, which had the conventional firebox. The table gives a summary of the tests as reported by the mechanical department of the Texas & Pacific.

From this table it will be noted that the fuel saving effected was substantial. In addition to the fuel saving in road service, there is a material saving in fuel oil used at terminals in firing-up. A test at Big Spring, Texas, of locomotive No. 541 versus a standard equipped locomotive of the same class, showed that there was a saving of approximately 42 gal. of oil in bringing the two locomotives up to the same gage pressure, all conditions being equal. This is accounted for by the fact that the tables, in addition to the sides, crown sheet and combustion chamber, begin to absorb the heat from the flame of the oil burner as soon as the fire is lighted in the firebox. The circulation of the water from the shell of the boiler through the tables and water legs causes the water to absorb the heat at a more rapid rate than a boiler equipped with a firebox of standard construction. The table construction eliminates the dead end to the mud ring, and the objection to firing up oil burning locomotives hurriedly, with the consequent strain to the firebox sheets, is eliminated.

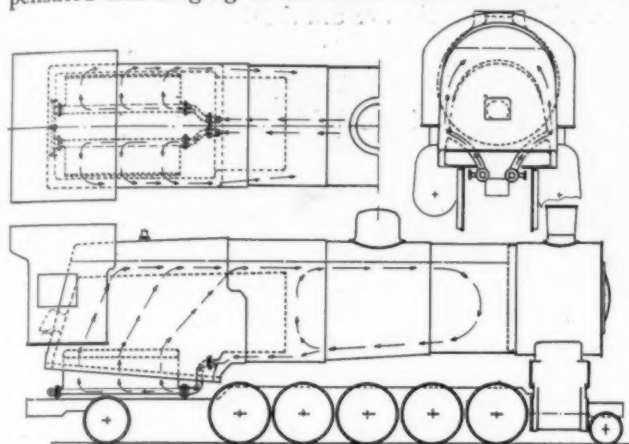
It will be noted from the drawings that the water tables present bare water carrying surfaces to the fire, which surfaces were previously covered with fire brick. No fire brick are used on the side sheets of the firebox or on the tables, and it will also be noted that only a burner wall, flash wall and bottom floor between the bulbs

Results of Tests Comparing the Martin Water-Tables with a Firebox of Conventional Construction:

Description	Eng. 541 (Martin water-tables)	Eng. 534
Oil consumed per trip, gal.	1,946	2,180
Gals. oil per 1,000 g.t.m. (actual)	8.38	9.24
Gals. oil per 1,000 g.t.m. (adjusted)	6.98	7.86
Evaporation, lb. water per lb. of oil	11.89	10.42
Time on road	5 hr. 55 min.	6 hr. 20 min.
Actual running time	4 hr. 34 min.	4 hr. 24 min.
Per cent of rated tonnage handled entire trip	97.35	97.05

January for fuel performance with locomotive No. 534 of the same type and class, were made under adverse weather conditions; the temperature varying from 15 to 30 deg. F. during the tests with the Martin tables and from 55 to 70 deg. during the runs made with the locomotive equipped with the standard firebox. How-

or mud drums of the tables is used. An oil burning locomotive firebox equipped with these tables, eliminates the direct attachment of the side sheets of the firebox to the mud ring, substituting in lieu thereof a longitudinally running expansion joint occasioned by the juncture of the table with the side sheet. The tables, with the side sheets, form a loop which is brought around and secured by the bottom flange of the tables to the mud ring. In this manner, the strains incidental to the expansion of the side sheets are effectively compensated and bulging of the sheet under the heat of the



Water Circulation Diagram with Inside Connection

firebox, causing it to move inwardly toward the fire and off the staybolts, is entirely done away with by the elimination of the direct attachment or anchorage of the side sheets to the mud ring.

Installation Provides Additional Features

This means of compensating side sheet expansion reduces staybolt leakage and breakage to a minimum and affords relief in foaming water districts where staybolt trouble is greatly aggravated. The value of the water table construction in preserving the integrity of the firebox sheets was practically brought out in the operation of locomotive No. 541 between Big Spring and Toyah, Texas, in the foaming water district of the Rio Grande Division where, owing to the shortage of rainfall and the highly concentrated condition of the water supply, it was necessary to brick the side sheets of locomotives equipped with conventional fireboxes of the same class six rows of staybolts high, whereas locomotive No. 541 operated under the same conditions without any brick whatsoever covering the side sheets or water tables. The operation of the locomotive under the foaming water conditions referred to, showed a stabilization of the water in the glass, which is accounted for by the increased water holding capacity of the tables in the bottom of the firebox, permitting the engineman to better control the water than in the standard equipped locomotive.

The blowoff and wash-out arrangement also provides certain advantages. The construction of the tables at the bottom ends of the mud drums permits locating the blowoff cocks so as to blow off from the lowest point of the firebox and boiler. Adequate washout plugs are installed, which makes the general system of removal of sedimentary matter from the boiler, washing out and changing water at terminals expeditious and practical.

The Table and Firebox Construction

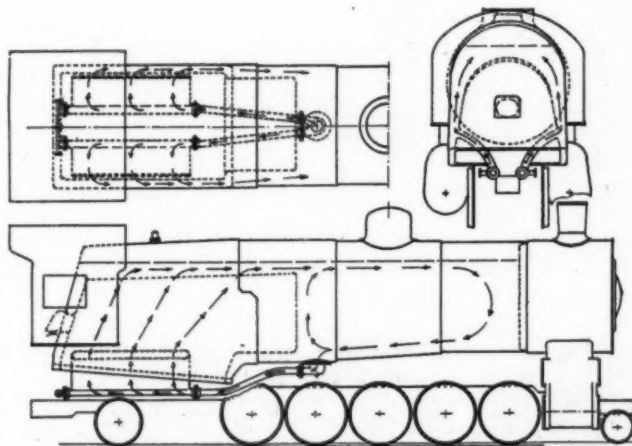
The problem of designing the Martin tables was one of taking the coal burning mud ring firebox, and form-

ing it into a firebox primarily adapted to burn fuel oil so that the heat of combustion could be utilized to the maximum; in other words, provide a construction without making any radical changes from existing standards so that, should the necessity arise at any time to convert the oil burning locomotive to coal burn, the complete change could be effected in a relatively few hours. To this end, the Martin oil burning locomotive firebox was constructed on the principle that the bottom of the firebox could be utilized to advantage in the provision of water-circulating steam-generating tables or elements to serve as the bottom of the firebox, and feeding the tables or bottom with water from the barrel of the boiler in such a manner that a continuous circulation of the colder water from the barrel of the boiler would be provided by way of the tables into the side water legs of the firebox.

The effect of this is a dual one, in that the tables not only increase the active heating surface in the bottom of the firebox but are the means of causing active circulation of the water in the side legs, which is ordinarily dormant a considerable distance over the mud ring and, because of being dormant, requires the protection of a refractory brick covering along the side sheets.

Circulation of the Water

The circulatory movement of the water from the barrel of the boiler through the water tables into the water legs is occasioned by the difference in thermal head existing between the colder water in the shell of the boiler and the heating of this water in its passage through the



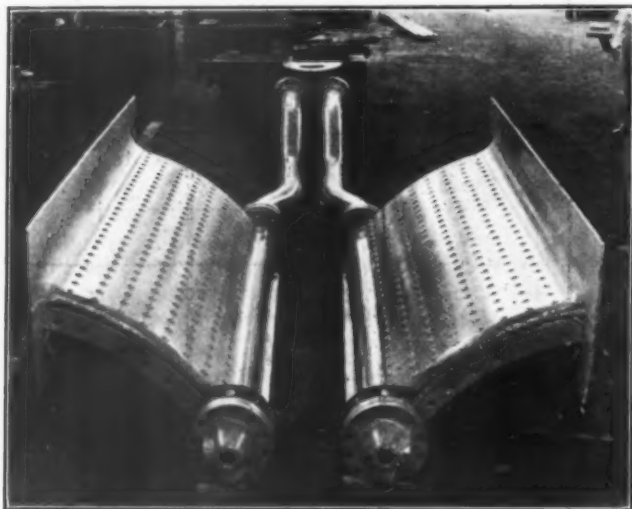
Water Circulation Diagram with Outside Connection

tables. The result is that the water is lightened in the side legs by steam bubbles and is continually displaced by the colder water from the boiler barrel. The water tables act as generating surfaces not only to cause the active movement of the water through themselves but cause the steam line to be brought down the water legs from below the crown sheet, thereby materially increasing the capacity of the side sheet heating surfaces.

The object of this construction was to provide oil burning locomotives with a simple and efficient arrangement without any radical departure from the present standards, while taking advantage of all of the properties contained in the combustion of fuel oil. With this point in mind, the water tables are curved downward below the mud ring to form the deepest possible combustion chamber and to present convex surfaces to the fire. In this manner the firebox combustion volume,

which is important in burning gaseous types of fuel such as fuel oil, is maintained at its maximum.

The illustrations show how the tables are constructed. They provide a continuation of the water legs of the firebox when attached by their flanges to the side sheets and mud ring, and are built in accordance with federal and state requirements. To install the tables, a strip of the side sheet is cut away approximately 18 in. above the mud ring, and the tables are substituted in place thereof, being welded along the upper flanged edges to the side sheets and riveted on the lower flanged faces,



Martin Water-circulating and Steam-generating Tables Ready for Application

through existing ring rivet holes, to the mud ring. Should the occasion arise to change the fuel from oil to coal, the tables can be quickly removed with a cutting torch and a strip of sheet welded to the side sheets of the firebox. Two drawings show two forms of water passages. One is termed the outside connection, which is made from the shell of the boiler by a cast steel Y-header, while the other is designated as the inside connection, taken from the throat sheet of the firebox

* * *



The First Annual Presentation of Bronze Plaques to Railroads

Left to Right—Homer E. Niesz, president of the National Safety Council, presenting plaques to E. E. Calvin, vice-president, the Union Pacific System, Group A winner; Thomas H. Carrow, superintendent of safety, the Pennsylvania, group G winner; W. M. Jeffers, general manager, Union Pacific Railroad, Group B winner; H. U. Platt, general manager, Oregon Short Line, Group C winner; F. H. Knickerbocker, general manager, Los Angeles and Salt Lake, Group D winner; W. A. McGonagle, president, Duluth, Missabe & Northern, Group E winner, and H. Johnson, president, Duluth & Iron Range, Group F winner.

through a flanged steel nozzle connection. The pipes or conduits carrying the water are preferably made of copper and in accordance with the rules and regulations of the Department of Commerce for high-pressure pipes on ocean-going vessels. The copper pipes readily adapt themselves to all strains of expansion and contraction, and on this account are ideal water carriers. They carry cast steel flanges which are in turn secured to the cast steel flanges provided at the lower front ends of the tables. The cast steel flanges on the tables also carry cast steel blowoff headers, to which the right and left blowoff cocks are attached.

Freight Car Loading

WASHINGTON, D. C.
REVENUE freight car loading amounted to 1,020,916 cars during the week ended May 26. This was the third consecutive week in which the total exceeded a million cars, although showing a decrease of 5,873 cars as compared with the corresponding week of last year and of 59,870 cars as compared with 1926. Miscellaneous freight loading, 396,059 cars, was the only commodity classification which showed an increase as compared with last year, but the decrease in other classes were slight. Loading in the Eastern, Northwestern, Central Western and Southwestern districts was larger than a year ago. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

Revenue Freight Car Loading			
Week Ended Saturday, May 26, 1928			
Districts	1928	1927	1926
Eastern	243,131	236,302	261,684
Allegheny	209,909	213,720	218,814
Pocahontas	57,214	62,891	57,816
Southern	142,488	152,066	155,360
Northwestern	157,679	156,283	165,894
Central Western	137,320	134,034	144,572
Southwestern	73,175	71,493	76,646
Total Western Districts	368,174	361,810	387,112
Total All Roads	1,020,916	1,026,789	1,080,786
Commodities			
Grain and Grain Products	38,909	39,746	44,189
Live Stock	26,149	28,341	28,640
Coal	162,854	165,710	177,598
Coke	9,913	10,493	11,776
Forest Products	68,530	72,008	79,380
Ore	58,853	62,475	66,499
Merchandise L. C. L.	259,649	261,547	266,304
Miscellaneous	396,059	386,469	406,400
May 26	1,020,916	1,026,789	1,080,786
May 19	1,003,497	1,027,498	1,039,070
May 12	1,001,983	1,029,424	1,029,748
May 5	979,662	1,024,761	996,216
April 28	961,928	1,021,576	995,408
Cumulative total, 21 weeks	19,533,801	20,525,186	20,178,251

The freight car surplus averaged 299,521 during the period ended May 23, a reduction of 108 cars as compared with the total on May 15. The total included 137,632 box cars, 109,309 coal cars, 25,919 stock cars and 17,416 refrigerator cars.

Canadian Car Loadings

Revenue car loadings at stations in Canada for the week ended May 26 totalled 62,066 cars, a decrease from the previous week of 6,927 cars, due to a national holiday, and an increase of 8,140 cars over the same week last year.

	Total Cars Loaded	Total Cars Rec'd from Connections
Totals for Canada		
May 26, 1928	62,066	38,992
May 19, 1928	68,993	41,287
May 12, 1928	69,448	41,597
May 28, 1927	53,926	37,796
Cumulative Totals for Canada		
May 26, 1928	1,324,388	843,360
May 28, 1927	1,264,498	822,307
May 29, 1926	1,176,925	788,199



The Central of Georgia Hospital at Savannah Is Artistically Designed

Maintenance of Men Shows Profit

Central of Georgia meets with gratifying response from employees in caring for their welfare

THERE are now in active service on the Central of Georgia two engineers, who were regarded as hopelessly blind some 18 months ago. These men are both young, with many years of service, profitable to themselves and to the railway, ahead of them. In one's case, blindness was caused by physical conditions, while the other suffered from tumor of the brain. Viewed entirely from a materialistic standpoint, the railway profited by the return of these men to duty. The investment represented in their training amounts to a considerable sum,—thousands of dollars, in fact. Through the plan of hospitalization put in effect in July, 1927, this investment has been saved and two loyal employees have been returned to usefulness.

The Central of Georgia opened its own hospital in Savannah in July, 1927. This hospital is supported partially by a payroll deduction of 75 cents a month from each employee, in return for which the employees are entitled to complete health and hospital service free of charge.

While the two cases cited above are extreme and unusual, they represent only a small portion of the service rendered since the hospital has been in operation. In the six months from July 1, 1927, to December 31, 2,640 treatments were given to employees by the hospital department and the number is increasing rapidly. These were not all sick people by any means. The Central of Georgia has made a successful effort to sell to its employees the idea of reporting voluntarily for periodical physical examinations. As may be imagined, when this was first brought to the attention of the employees, some of them suspected that the management was actuated by ulterior motives. However, an investigation by the general chairman and others of the employee organizations soon dispelled any doubts and at the present time, from 10 to 15 employees, from all classes of service, report for thorough physical examinations every day. In most cases little or nothing is found to be wrong. In many cases, however, disturbances are found which, if permitted to continue, might lead to serious results, but

which may be remedied by a few days' treatment at the hospital.

Another factor of importance is that of treating and examining the officers of the company. In the aggregate, the general officers of any railway represent an investment of hundreds of thousands of dollars. On the Central of Georgia, every one of them has taken advantage of the facilities afforded, and undergoes regular physical examinations and treatments if necessary. In this manner, another large investment is protected.

A Thoroughly Modern Hospital

The capable and experienced staff and the thoroughly modern equipment at the hospital are such as to inspire confidence on the part of the patients. The hospital is in direct charge of the chief surgeon of the railway, under the jurisdiction of the vice-president and general manager. The staff is composed of 14 doctors, including 3 surgeons, 2 internists, 2 oculists, a roentgenologist, a neurologist and a dentist. All of the nursing staff are graduates, no student nurses being employed.

The hospital is completely equipped with all facilities necessary for thorough physical examinations, including x-ray apparatus, dental, surgical and medical examination rooms and laboratory. Four fully equipped operating rooms are provided, with sterilizing rooms adjacent, the entire third floor being devoted to surgery. Two solariums are provided on the second floor for convalescents. Separate, but identical, facilities are provided for white and colored patients. The hospital has been rated as the finest in the country for its size by authorities on hospital equipment and management.

While the general plan of hospitalization provides for centralization of all treatments and examinations at the hospital in Savannah, arrangements have been made with hospitals at outside points to take care of emergency cases. Such hospitals are situated in 17 different cities at various points along the line. These are used for urgent cases only or for treatments for which there is an immediate need. In all other cases, the patients are

sent to the Savannah hospital. A list of emergency hospitals is carried in the current timetable.

A well-planned and continuous safety campaign has been conducted on the Central of Georgia for some years past. In this, the company surgeons have always played a prominent part. They are converts to the theory that a man's physical condition has a great deal to do with his mental alertness. For some years the Central of



The Hospital Entrance Is Imposing

Georgia has required its prospective employees to pass an unusually strict physical examination before entering the service. This has served as a preventative measure to some extent. With the hospitalization plan in effect, the benefits of physical examinations as preventative measures have been greatly increased. With a continually increasing number of men reporting for periodical examinations, the danger of accidents from unsuspected physical infirmities is very much lessened. The general health of the employees is maintained on a higher average and personal injuries necessarily decrease. With the services of the hospital staff at their command, the employees are no longer forced to rely on symptomatic treatment by local physicians, which is guesswork at best. Instead, they come in to the hospital where they receive a thorough scientific examination, which, in the majority of instances, results in a cure before serious developments occur.

There were 1,121 personal injuries on the Central of Georgia in 1926. In 1927, there were 693 injuries to employees, passengers, trespassers and persons hurt in grade crossing accidents, a decrease of 428 injuries, or nearly 40 per cent. These figures include all injuries, however slight, as the Central of Georgia, in preparing accident statistics for its own use, does not differentiate between "reportable" and "non-reportable" accidents. While this improvement in safety is not all attributable to the hospital department by any means and the exact proportion of improvement from every cause is im-

possible to determine, nevertheless, the hospital department is credited with a considerable influence in bringing about the better showing.

The Central of Georgia does not confine its welfare work entirely to the employees' physical condition. The road is comparatively small, comprising 1,921 miles of line, with 10,000 employees. Its executives are thus in a better position to know most, if not all, of the employees, a condition that would be considerably more difficult on a larger railway. Realizing the advantages of the situation from the standpoint of promoting the welfare of the employees and their loyalty to the company, the executives have continued for some years a successful effort to foster a spirit of co-operation and loyalty. In pursuance of this idea, a number of unusual things are done. When, for example, a baby is born in a Central of Georgia family, the president writes a personal letter of congratulation to the proud father, asking permission to open a bank account for \$1 in the name of the new arrival. A card is also mailed by the president to the youngster on the occasion of its first birthday. The reaction to this has been gratifying and no less than 70 per cent of the bank accounts thus started are continued in effect as the baby grows older.

More than \$1,250,000 has been paid to Central of Georgia employees and their beneficiaries in disability and death claims, under the group insurance plan which has been in effect for the past five years. The total amount of insurance in force under this plan is now \$25,000,000 or an average of about three thousand dollars for each employee. Nearly 90 per cent of all employees are insured under this plan. The company shares in the payment of the premiums, which are paid by monthly payroll deductions. Each employee is entitled to insurance, ranging in amounts from \$1,000 to \$10,000, depending upon the position held and the compensation earned.

When an employee dies, the president writes a personal letter of advice to the beneficiaries. He advises them that the insurance may be collected without the services of a lawyer or other agent. In addition, an arrangement has been made between the railway and the banks along its line to give financial advice to the beneficiaries. In his letter, the president refers them to some conservative bank officer in their own town, stating that this banker will be glad to give them any advice they may desire as to investing the money.

A copy of the president's letter goes to the supervisory official under whom the deceased employee had been working. The check from the insurance company is also mailed to him. He makes a personal call on the beneficiary, delivers the check, and repeats the president's advice as to calling upon the banker before indulging in any speculation. In this manner, many of the beneficiaries have been saved from unwise investments.

The basic idea in all of these activities is to promote the interests of the employees, thereby increasing their loyalty and their efficiency. Everyone on the "Central" knows nearly everyone else and the spirit of co-operation thus engendered has been an invaluable asset in promoting various campaigns. The employees know that the management is concerned in their welfare. In return, they are concerned with the welfare of the railway. Some remarkable showings have been made as a result of this spirit. Personal injuries have been reduced, much new business has been brought to the railway by employee solicitation and other benefits have been derived. One of the most remarkable of these, the showing made at the agencies in reducing exceptions on less than car-load freight, will be described in an early issue.

New Water Supply Facilities Effect Economies On the Southern

Steam pumping plants are giving way to automatic and semi-automatic electrical operation

DURING the last few years, the Southern Railway has been giving an unusually large amount of attention to the modernizing of its water supply facilities, with the result that at many points it is now securing a more dependable supply of water, combined with greatly reduced pumping costs. This work, which it is planned to continue for a number of years, is being carried out in connection with other extensive improvements which the Southern is making generally over the system. In general it includes such measures as the more effective spacing of certain water stations, the installation of wayside treating equipment at points where treatment is desirable but where large expense is not justified, and the elimination of old uneconomic steam plants where possible by the substitution of automatically-operated motor-driven centrifugal pumps.

Fortunately, the Southern is not confronted with a serious water supply problem as regards the character of the water itself. Most of the supplies over the system are taken from rivers or open bodies of water, and the most difficult problem at these points is the presence of silt or other solid matter in suspension. As a rule, the water is comparatively soft, containing less than five or six grains of hardness per gallon, which is the maximum limit generally allowed on the road. Exceptions to this occur however, as for example between Bristol, Va.-Tenn., and Chattanooga, Tenn., where the hardness

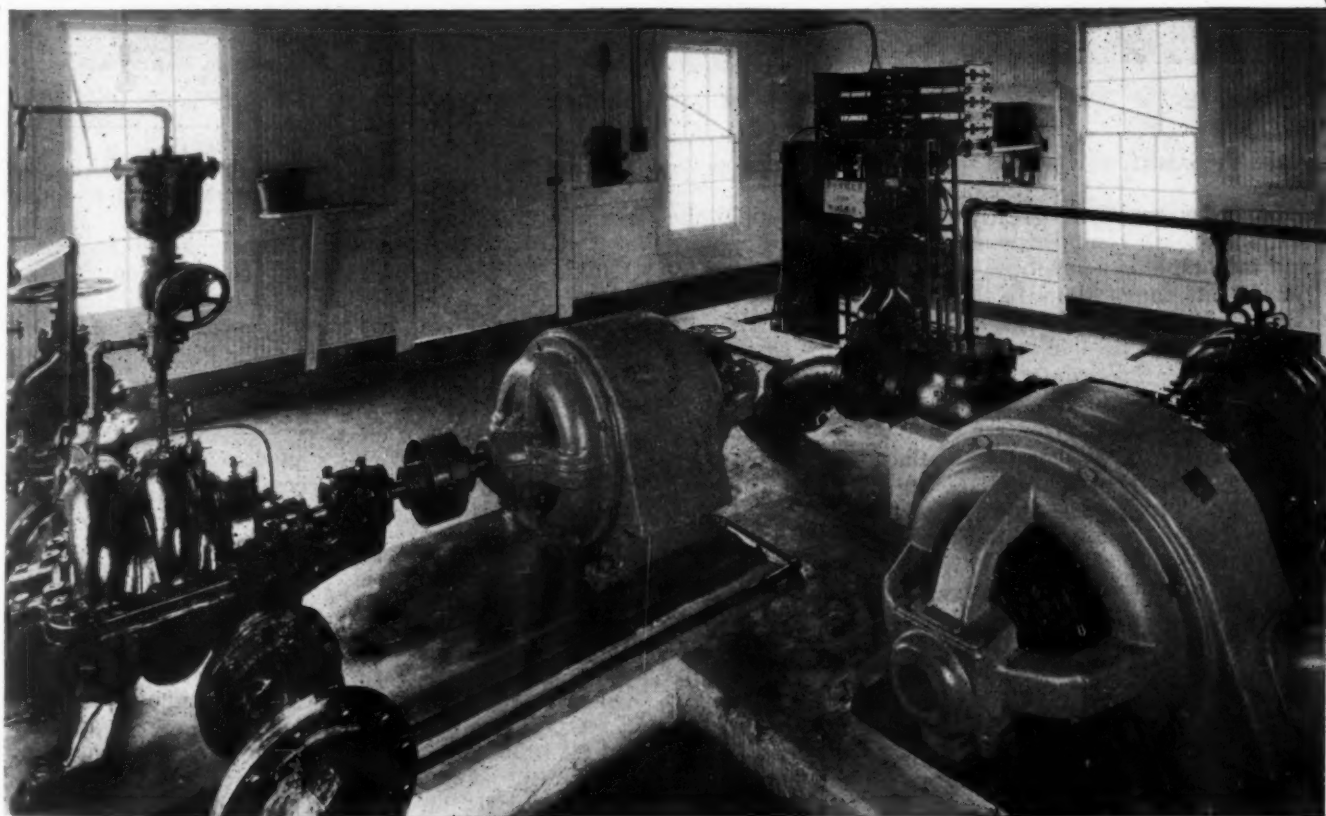
ranges from 8 to 12 grains, and between Birmingham, Ala., and Columbus, Miss., where the hardness is even slightly higher. In such sections, where large capacity treating stations are not required or justified, wayside tank douching equipment has been installed or is being contemplated in the general improvement program to lower the content of scale-forming solids.

Until the last few years many of the pumping plants on the Southern have been steam operated. The great majority of these are still in service and are being operated as economically as is possible. At some points, where coal is expensive or the equipment needs replacing, either because it is worn out or of insufficient capacity, electrically-operated duplicate pumping units are being installed, and in many instances arranged for automatic operation. At some points where there were steam pumps, and where the amount of pumping would not justify a duplicate installation of electrically-driven pumps, one such pump has been installed, and one of the old steam pumps maintained in service as a reserve unit.

Eight Important Water Stations

Have Been Completely Modernized

The major part of the Southern's water supply improvement work has been carried out during the last two years. Some of the most interesting projects



One of the Automatic Water Stations at Charlotte, N. C.

undertaken during this period include the remodeling of seven important water stations where automatically-operated motor-driven centrifugal pumps have replaced steam-operated pumps, and the rebuilding of another important station, where semi-automatic equipment has been installed. The automatic installations are at Shipman, Va., Gretna, Va., Hot Springs, N. C., Charlotte, N. C., Jefferson City, Tenn., Hodges, Tenn., and Ludlow, Ky., while the one semi-automatic station is at Spencer or Yadkin, N. C. All of these modernized stations have now been in service for some time and have proved so satisfactory and economical of operation that it is expected that the full automatic stations will pay for themselves in two to three years through the savings effected.

At all of these stations the water supply is taken from rivers and with the exception of the station at Yadkin, the water is pumped to storage tanks without previous sedimentation or treatment. All of the stations are installed with intake screens, and gravity lines carry the water to concrete suction wells located near the pump houses so as to shorten the suction lines and thereby

nal maintainers who look after the electrical equipment, although section men and pump repairers usually attend to oiling the pumping units. In order to prevent freezing of the pumps and pipe lines at the automatic stations, the pump houses provided at these stations are sealed with Celotex board.

Yadkin Water Station is New Throughout

The most important of the new water supply facilities of the Southern is at Yadkin, which serves the extensive shop and engine terminal facilities of the Southern at Spencer, about three miles distant, where the water requirements are about 1,300,000 gal. per day. This installation is of particular interest because it is new throughout, and includes a large reinforced concrete sedimentation reservoir for removing silt from the water before it is pumped to the storage tanks.

The work on the pumping plant at Yadkin was made necessary by the construction of a new dam in the Yadkin river, about 20 miles down stream from Yadkin, to regulate the flow of water at a hydro-electric power plant of the Tallahassee Power Company. This



The Reservoir and Sedimentation Basin at Yadkin, N. C.

make the centrifugal pumps more dependable in operation.

In order to insure a dependable water supply the stations are all equipped with duplicate units of pumps and motors, either unit being capable of meeting the requirements imposed in from 5 to 12 pumping hours. The pumps and motors of these units are direct-connected through flexible couplings, and in the case of the automatic stations, the motor in each unit is equipped with a separate automatic starting panel. At the automatic stations the motors are operated automatically by tank float switches installed in the storage tanks, the motors being started when the water drops between three and four feet in the storage tanks, and stopped when the tanks have been filled to capacity.

To prevent the pumps from losing their priming in the case of foot valve leakage, a by-pass is installed from the discharge line to the suction line, and is kept open, thereby keeping the suction line and the pump well filled with water at all times under a head from the storage tanks. With the installation of these automatic stations, the pumpers were laid off, the old steam pumps were taken out of service, and the plants now require only general inspection every few days, primarily in connection with oiling. This inspection is made by sig-

dam contemplated impounding a reservoir with a shore line of about 360 miles, which would inundate the old pumping facilities.

Aside from the necessity of renewing the facilities at Yadkin owing to the reservoir construction, this was contemplated because of the inadequate facilities at that point. Briefly, the old facilities consisted of a brick pump house with an adjoining brick boiler house, two old locomotive-type boilers, and two steam-operated pumps which were uneconomical in operation, and of insufficient capacity to meet requirements. The old plant was located near the water level of the river and drew its supply direct from the river without an intake well and without treatment.

Effective Intake and Suction Wells are Provided

The new facilities at Yadkin consist essentially of an intake box equipped with racks and screens, a gravity feed line, a suction well, two suction lines, a three-level pump house housing the pumping equipment and chemical feeding apparatus, a sedimentation basin of 2,500,000 gal. capacity, and 16-in. to 8-in. discharge lines to the various tanks of the Spencer water supply and fire protection systems.

The new intake box at the plant is a rectangular, re-

inforced concrete structure, carried down to a rock foundation, with a cut-water on the up-stream side. On the down-stream side of the box, which is the intake side, there is an additional box-like section integral with the main intake well, which supports the rack bars and the screens for excluding debris from the intake. The racks, which are held in grooves, are made up of 3-in. by 1/4-in. bars, space 1 1/4 in. center to center. There are two of these racks, one extending over an opening at the base of the box toward one side, and the other over a smaller opening toward the opposite side of the box, at a higher elevation. Water passing through these two racks is separated in the first section of the intake by means of a vertical concrete wall.

Directly behind the gratings are two removable screens of 1/2-in. mesh, which protect three intake openings into the main intake well. Two of the openings are back of a large low-level screen, one located at one side and above the other. Both of these openings are equipped with 24-in. by 36-in. sluice gates. The other opening into the main intake well is located directly behind the higher screen and rack, and is not fitted with a sluice gate.

The feed line from the intake box to the suction well is a gravity line, about 100 ft. in length, of 18-in. cast iron pipe. The suction well, which is located just outside of the pump house to permit greater efficiency of operation of the pumps, is a rectangular reinforced concrete box, with inside dimensions of 11 ft. long, 6 ft. wide and 26 ft. high. The intake gravity line enters the suction well four feet above the bottom, and this opening can be closed off by a sluice gate. Two independent suction lines of 12-in. cast iron pipe lead to the pumps, the intake ends of both lines being fitted with foot valves.

The Pump House Has Three Levels

The pump house is a reinforced concrete and brick structure about 43 ft. long by 30 ft. wide, and is laid out with three working levels. The foundation, the floors, and the side walls up to the highest floor level are of waterproof concrete, above which the upper part of the house is of brick, with a frame roof covered with slate-surfaced prepared shingles. All of the window sash are of steel with center-hung sections to afford ventilation.

In the three-level construction of the house, the top floor is in reality a platform as it extends across only about one-third of the house at one end. On this floor are located the chemical treating facilities of the plant. The second floor, which is at the ground line, extends across the remaining two-thirds of the house and supports the high pressure pumps to the discharge line. The lowest level in the house, which is 32 ft. lower than the high level, is in reality a waterproof pump well, for on this level are located the low pressure pumps which deliver the raw river water to the sedimentation basin.

As with most of the recently remodeled water supply plants on the Southern, the pumping units at the Yadkin plant are in duplicate, and are so arranged that they can be used alternately, one being held in reserve for an emergency. The two low pressure or raw water pumps are Worthington 10-in. single-stage centrifugal pumps of the volute impeller type, with capacities of 1800 gal. per minute. These pumps are direct-connected to two 25-hp. Westinghouse wound rotor type motors.

The two high pressure or clear water pumps are Worthington 10-in., two-stage centrifugal pumps of 1800 gal. per minute capacity each, direct-connected to

two 250-hp. Westinghouse wound rotor motors. These pumps are fed by a 12-in. line direct from the sedimentation basin, and each pump has a connection within the house to the 16-in. discharge line. Both of the clear water pumps are protected by gate, check and relief valves.

The treating facilities at the plant are designed alone for douching the raw water with alum and dry sodium aluminate in order to bring about coagulation in the sedimentation basin, and to improve the general character of the water. These facilities, which were furnished by the American Water Softener Company, Philadelphia, consist essentially of two cypress chemical solution tanks of 1400 gal. capacity each, and orifice feed boxes for controlling the delivery of the alum and sodium aluminate solution to the raw water. From this equipment the measured solution passes by gravity to the suction well through a 1 1/2-in. brass pipe line, which terminates directly in front of the mouth of the 18-in. raw water line from the river intake.

Sedimentation Basin Has

Capacity of 2,500,000 Gallons.

The sedimentation basin or reservoir, which is of reinforced concrete, is 181 ft. long by 144 ft. wide, and has a capacity of two and one-half million gallons. For the purpose of providing additional strength and stability to the structure, and also for directing the course of the water, a heavy longitudinal wall was built through the center of the reservoir, dividing in into two main sections which are further divided into two equal parts by longitudinal baffle walls provided to direct the flow of the water.

The bottom of the reservoir is a six-inch reinforced concrete slab which has a uniform slope from the pump house or intake end, toward the opposite end, dropping about three feet in the length of the reservoir. At the shallow end of the reservoir the wall has a clear height of 12 ft. above the bottom, while at the deep end it has a corresponding height of 15 ft. 5 in. In general, all of the walls have battered faces on both sides, and the footings are of the spread pedestal type, with anchor walls to prevent sliding. Further stability is given to the outer walls through the banking of earth around the outside to within a few feet of the top.

Basin Provides for Effective Sedimentation

In operation, the douched raw water enters the reservoir through an intake pipe at the end of one of the outside sections, and is immediately diffused, stiller, and further mixed with the chemical solution by passing through a vertical reinforced concrete stilling baffle, extending across the reservoir section and provided with 30 four-inch holes which are spaced uniformly throughout the middle third in its height.

From the stilling baffle the water passes unobstructed through the first section of the reservoir, around the open end of the longitudinal baffle wall, and about half the distance on the return trip, until the flow of its lower section is retarded by a solid reinforced concrete bottom baffle, four feet in height. Beyond this baffle, the surface water is retarded near the end of the reservoir by a reinforced concrete skimming baffle, four feet deep, from which point the water can be carried off to the clear water pumps through a 12-in. pipe outlet in the end wall near the bottom, or it can be made to continue its course around the reservoir, where similar obstruc-

tions to those mentioned, still the water while further sedimentation takes place. The former course might be desired in order to clean the second section of the reservoir, or because sufficient sedimentation in the water had already taken place. Thus, the first half of the reservoir can be operated as a complete unit, and similarly, the second half can be operated separately while cleaning the first half.

For the purpose of cleaning the reservoir, two sludge gates are provided in the deep end wall, which connect with a 14-in. clean-out line emptying into the river below the intake. In order to facilitate cleaning, all of the baffles extending to the bottom of the reservoir are equipped with removable bottom gates at the center, and in order to flush the mud from the floor of the reservoir, four 2½-in. hose connections are installed at the top of the outer walls.

System is Semi-Automatic in Operation

The pumping plant at Yadkin serves five water service tanks and two fire protection storage tanks through 16-in. and 8-in. pipe lines. The 16-in. line, which is 14,000 ft. in length, was constructed of bell and spigot cast iron pipe, and replaces two old eight-inch lines of similar construction. This line was laid along the right-of-way with an average cover of about three feet, the main summits being provided with air relief valves, and the low points fitted with clean-out gate valves.

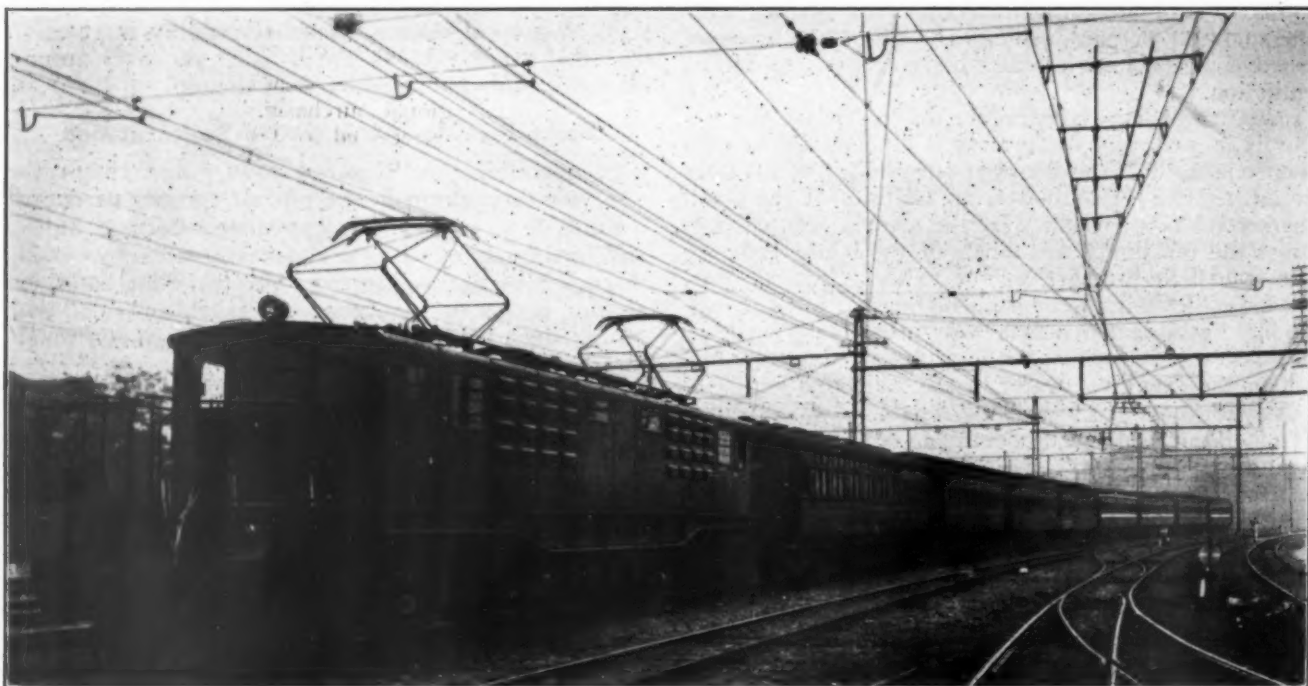
The first service tank tapping the line is a 60,000-gal. roadside tank about 2,000 ft. from the pumping plant. The second tank in the line is a 200,000-gal. tank at the north end of the extensive shop and engine terminal layout at Spencer, this tank being at the extreme end of the 16-in. line. From this point three 8-in. lines extend for about 3,500 ft. to a group of three tanks, one of 60,000-gal. capacity, and two of 100,000-gal. capacity, located near the center of the shop layout. An 8-in. lateral tapping one of these lines serves the two fire protection system storage tanks with capacities of 200,000 gal. each.

In the operation of the water supply system, the three tanks near the center of the terminal are filled first, these being at about the same elevation and lower than the large tank at the north end of the terminal. When one of the pumps is in operation at the pump house, it will continue to supply water to the group of three tanks until the intakes to these tanks are shut off automatically by altitude pressure valves. When this occurs, pumping continues until the large tank at the north end of the terminal is full, when a float switch rings a bell or lights a light at the pump house, and the pumps are stopped by the pump house attendant. The fire protection storage tanks are, of course, maintained full at all times and therefore do not affect the general operation of the water system. In the case of fire however, these tanks can be cut into the line immediately, and, by a system of valves in the main pipe lines, can be supplied by the full output of the pumping plant.

When the water recedes to a predetermined level in the large tank at the north end of the terminal, a float limit switch operates an alarm at the pump house which continues to ring until the attendant starts one of the high pressure pumps. Thus the cycle continues at the pumping plant under the care of three attendants, each working on eight-hour shifts. Through the new installation, the Spencer facilities are assured of an adequate and economical supply of clear water at all times without depending upon the city water supply of Salisbury, N. C., about three miles distant, which was not entirely reliable and decidedly more costly to the Southern.

The new water facilities at both Yadkin and at Spencer were planned and constructed under the general supervision of J. B. Akers, assistant to vice president, and under the direct supervision of A. B. Pierce, engineer of water supply, who has also been in charge of all of the general improvement of the Southern's water supply facilities. The actual construction work on the Yadkin pumping station and sedimentation reservoir was carried out under the direct supervision of J. A. Moir, resident engineer.

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Electric Express Passenger Train, Tokaido Line, Japanese Government Railways

Canadian National Reorganizes Its Purchasing Methods

Advance contracts, simplified practices and educational classes bring more efficient operation

By H. L. Taylor

Assistant Purchasing Agent, Canadian National, Winnipeg, Man.



In the Purchasing Offices at Winnipeg

THE amalgamation of five railway systems and numerous subsidiaries into the Canadian National Railways was accompanied by a reorganization of the purchasing and stores departments of these properties that has seen many changes made in the conditions, facilities and methods of work. In point of mileage, the Canadian National Railways is the most extensive railway system in America under a single management. Besides a total trackage of some 23,000 miles, taking in the whole of Canada from the Atlantic to the Pacific, it owns and operates its own hotels, telegraph and express services, sleeping and dining cars and steamships. There were also many different climatic and geographic conditions to consider as well as problems of government ownership which have made amalgamation looking to the greatest economy and service intricate.

The purchasing and stores departments, like others involved in the amalgamation, were faced with duplication in officers and staffs, as well as divergent views as to the best methods of purchasing and storing and the existence of long established practices, each considered the best by those accustomed to work under them. In reorganizing the purchasing branch careful study was made of the various ideas and methods each had to offer. A special representative was also detailed to visit most of the large railroad purchasing offices in the United States and a selected number of manufacturing firms.

Regional Reorganization

As reorganized, the purchasing and stores departments are co-ordinated. The headquarters are in Montreal and there are four regions:

The Atlantic region, with headquarters at Moncton, N. B., taking in Prince Edward Island, Nova Scotia, New Brunswick and part of Eastern Quebec.

The Central region, with headquarters at Toronto, Ont., taking in the greater part of Quebec and Ontario, also the lines in eastern United States.

The Western region, with headquarters at Winnipeg, Man., taking in Ontario west of the Great Lakes, also Manitoba, Saskatchewan, Alberta & British Columbia, and the Duluth, Winnipeg and Pacific Line.

The Grand Trunk Western region, with headquarters at Detroit, Mich., taking in lines in the United States between Detroit, Port Huron and Chicago.

Purchasing offices are established in each of these re-

gions, co-ordinating with other regional offices. In addition, a purchasing agent is located at Montreal to look after the requirements of Canadian National Steamships. The fuel, tie and stores branches also established offices in each region in conjunction with the purchasing branch and to meet special local conditions a purchasing agent was stationed at Vancouver, B. C., to look after lumber purchased on the Pacific Coast. All regional purchasing agents report directly to the general purchasing agent in Montreal, who in turn reports to the vice-president.

All large purchases, such as rail, track fastenings, shop equipment, bridges, rolling stock, etc., are contracted for at general headquarters. Commodities used system wide and in large quantities, such as lubricants, wheels, packings, waste, castings, tubes, steel bars, etc., are either covered by contracts or advance orders and the details broadcast to the regional purchasing agents to be used when requisitions are received for the commodities from the regional general storekeepers. Other commodities up to a certain value are purchased directly by the regional purchasing agent on a competitive basis in accordance with schedules.

Forest products (consisting of cross ties, switch ties, piling, poles, posts) and fuel (consisting of coal, coke and locomotive fuel oil) are such large items of expenditure that two departments were formed to devote their whole efforts to the procuring, inspection and distribution of these commodities. They act individually and report directly to the vice-president.

Where the size of the regional purchasing office permits, the purchasing staff is divided into complete purchasing sections handling certain classifications of materials on which they have an opportunity to specialize. These sections, under the supervision of the chief clerk or assistant purchasing agent, consist of:

- Clerk-in-charge
- Assistant clerk
- Record clerk
- Invoice clerk
- Combined stenographer and order writer*

Each purchasing section handles all requisitions,

*On trial in Winnipeg only. Other offices have exclusive order writers.

tenders, records, invoices and correspondence for the commodities assigned and operates independently of other members of the staff in any operation from the receiving of requisitions to filling orders and passing the invoices on them.

All requisitions filed by the general storekeeper are classified according to the A. R. A. stores classification and are numbered; for example, 4/9/T. 5056 gives the month, stores classification, district stores symbol and



The Four Desks in the Foreground Form a Purchase Section Which Handles All Work for One Division of Supplies

district stores consecutive requisition number. The requisitions are further classified according to the kind of material. For example, all steel bars, bolts, repair parts, castings, paints, switch material, etc., are segregated on one or more consecutive sheets to facilitate quick handling and avoid mistakes. The schedule under which orders for different classes of material are received from each district store on specified dates during the month is also followed as close as possible, enabling the purchasing office to distribute the work more evenly and to avoid excessive handling of requisitions for the same commodities.

All Information on One Form

The requisition form is divided in half, one half for the stores departments use and the other half for purchasing department use. The form is blocked off in columns and allows for six items on each requisition (quadruple spacing) so that there is ample space for the purchasing department to note in consecutive order the information required for purchase. By so doing a complete record of all transactions is condensed to one sheet which is a permanent record. On the duplicate copy retained by the stores the ruling and headings of the right half of the form are different so that the stores can maintain a receiving and price record in the space that the purchasing department uses on the original requisition.

The requisition number is used as both the bid number and order number, which has been found beneficial to both stores and purchasing departments. The combined requisition and order form was given a searching study, but it was not considered practicable. Requisitions are registered in a simple manner when received in the purchasing department, and are registered out when the occasion arises.

Advance Buying Favored

The requisitioning of materials at seasonable periods

is watched, so that the purchasing department will have ample opportunity to obtain the best prices and deliveries. Quantity requisitions are another important feature. Much more favorable prices and steadier deliveries can be obtained when suppliers can learn a railroad's wants. It enables them to take care of their raw material supply and to manufacture on a large quantity basis instead of by piecemeal. Stores stocks need not be increased by such methods, as most orders can be placed on the "deliver as called for" plan, thereby making a supplier act as storekeeper for the time being.

Requisitions, being a permanent record, are filed in each purchase section, first by stores origin and second by a stores numerical number. The date and classes need not be considered.

The bid and tabulation forms register so that one typing and checking operation is all that is necessary. If the number of bids desired exceeds the capacity of the machine, ditto carbon is used and hectograph copies made. Obtaining monthly and quarterly prices or discounts on standard commodities, such as pipe, pipe fittings, bolts, screws, etc., lessens detail work on the bids and speeds up placing orders. The unit of price is necessary, as well as the time for delivery, and a special column is provided on bid and tabulation form for this

CANADIAN NATIONAL RAILWAYS	
WESTERN REGION	
PURCHASING DEPARTMENT	
UNION DEPOT	
WINNIPEG, MAN.	
ORDER NO.	
REQ. NO.	
BID NO.	
PLEASE FURNISH THE FOLLOWING MATERIAL CONSIGNED TO CANADIAN NATIONAL RAILWAYS	
CARE	
ROUTE	
G. P. AGENT'S COPY	
DELIVERY	SALES TAX
F.O.B.	TERMS
<small>IN ACCEPTING THIS ORDER, IT IS UNDERSTOOD THAT YOU AGREE TO THE TERMS AND CONDITIONS SHOWN ABOVE, AND ALSO TO THE TERMS AND CONDITIONS PRINTED ON BACK OF THIS ORDER, WHICH ARE HEREBY MADE A PART HEREOF.</small> <small>THE RIGHT IS RESERVED TO CANCEL THIS ORDER, UNLESS FILLED PROMPTLY, OR FILLED ACCORDING TO DELIVERY SPECIFIED.</small> <small>IF YOU CANNOT FILL ANY PART OF THIS ORDER, NOTIFY THE UNDERSIGNED AT ONCE. ALL CORRESPONDENCE CONCERNING THIS ORDER TO BE ADDRESSED TO THIS OFFICE.</small> <small>ORDERS ISSUED IN DUPLICATE WITH BILL OF LADING OR EXPRESS RECEIPT TO PURCHASING AGENT BY MAIL, NOT LATER THAN ONE DAY AFTER EXPEDITED IS MADE. ALL SHIPMENTS WILL BE DELIVERED FROM THE ACTUAL DATE INVOICES ARE RECEIVED BY THE PURCHASING AGENT.</small>	
F. W. TISDALE, PURCHASING AGENT	

A Copy of the Order Form on Which the Canadian National Buys Material

information. As cash or term discounts are a large item in reducing expenditures, such discounts are obtained by using a printed clause and space for entering the discount, so it will be clearly shown on every bid form. Bids and tabulations are filed alphabetically according to the class of the material and by progressive number. No registration is deemed necessary.

After several experiments the fanfold order form and the fanfold order machine were adopted. The form consists of seven sheets, the original, the office copy, the general purchasing agent's copy, a store copy, a consignee's copy, a delivery copy and an inspection copy. All copies give the same details as the original, except the inspection copy from which the prices are eliminated, by using a narrower carbon paper. The need of so many copies is important to the plan of fully advising all departments, especially the man in the field, so that each can know where and when the requirements are purchased, and arrange the work accordingly.

The fanfold order machine, first used in 1919, has proved a great asset in speeding up the typing of orders.

Its type is all capitals to insure clearness and legibility. The machine in the Winnipeg office is also used for typing bids and tabulations by throwing back the order form feeder and inserting the bid and tabulation forms. The numbering of orders is simplified by using the requisition number only, which is also the bid number, so there is only one number for all departments. Every order is checked in detail against the requisition to avoid errors and omissions.

Stores Trace Material

Tracing for deliveries on orders is carried out by both stores and purchasing departments. The stores department traces all shipments made direct to the stores, and the purchasing department looks after all direct shipments to consignee other than storekeepers. By so doing the commitments are not affected before the material is actually required, as the storekeepers are more directly in touch with the using departments, particularly with the shops schedules, than the purchasing department can be. Required delivery datings on requisitions are essential

1. RENDER INVOICES IN QUINTUPPLICATE WITH BILL-OF-LADING OR EXPRESS RECEIPT TO PURCHASING AGENT BY MAIL NOT LATER THAN ONE DAY AFTER SHIPMENT IS MADE, AS ALL DISCOUNTS WILL BE RECKONED FROM THE ACTUAL DATE INVOICES ARE RECEIVED BY THE PURCHASING AGENT.

THREE EXTRA COPIES OF INVOICE AND COPY OF BILL OF LADING, PROPERLY CERTIFIED FOR CUSTOMS PURPOSES, MUST BE FURNISHED FOR SHIPMENTS FROM UNITED STATES.

2. DRAFTS WILL NOT BE HONORED.

3. NO GOODS WILL BE PAID FOR UNLESS REGULARLY ORDERED BY THE PURCHASING AGENT.

4. THIS ORDER MUST BE FILLED ONLY BY THE PERSON OR FIRM IN WHOSE NAME IT IS ISSUED, UNLESS OTHERWISE AUTHORIZED.

5. ORDERS MUST NOT BE FILLED AT AN ADVANCE IN PRICE OVER LAST QUOTATION, WITHOUT FIRST NOTIFYING THE PURCHASING AGENT, AND OBTAINING CONSENT IN WRITING.

6. QUANTITY OR CLASS OF MATERIAL ORDERED MUST NOT BE EXCEEDED OR CHANGED WITHOUT FIRST OBTAINING OUR CONSENT IN WRITING; MATERIAL OTHER THAN THE SIZES, ETC., CALLED FOR WILL NOT BE ACCEPTED.

7. INSPECTION WILL BE MADE AT DESTINATION UNLESS OTHERWISE ARRANGED. THE SHIPPER MUST PAY FREIGHT BOTH WAYS ON REJECTED OR INCORRECT MATERIAL.

8. NO CHARGE WILL BE ALLOWED FOR CRATING, BOXING OR DRAYAGE, UNLESS STATED ON ORDER.

9. SHIPPING NOTICE, IN DUPLICATE, SHOWING IN DETAIL ORDER NUMBER, REQUISITION NUMBER AND CONTENTS MUST ACCOMPANY EACH AND EVERY SHIPMENT OR BE MAILED DIRECT TO CONSIGNEE THE DAY SHIPMENT IS MADE.

10. THIS ORDER SHALL NOT BE ASSIGNED, NOR ANY MONIES DUE OR TO BECOME DUE THEREON BE ASSIGNED WITHOUT FIRST OBTAINING THE CONSENT IN WRITING OF THE PURCHASING AGENT.

11. THE CONTRACTOR HEREBY COVENANTS AND AGREES TO SAVE THE CANADIAN NATIONAL RAILWAYS HARMLESS FROM AND INDEMNIFY IT AGAINST ANY AND ALL CLAIMS WHICH MAY BE MADE AGAINST IT ON ACCOUNT OF ALLEGED INFRINGEMENTS OF PATENT RIGHTS AND EXPENSES OF ANY KIND IN CONNECTION THEREWITH, ARISING FROM THE USE OF THE ARTICLES NAMED IN THIS ORDER, OR ANY PART THEREOF.

THIS ORDER IS ACCEPTED WITH THE DISTRICT AGREEMENT ON THE PART OF THE SELLER THAT THE BUYER SHALL HAVE THE RIGHT TO REPAIR, AND THAT REPAIR PARTS MAY BE MADE BY OR FOR THE BUYER OR PURCHASER IN OPEN MARKET AS THE BUYER MAY DETERMINE; AND THAT IF THIS ORDER RELATES TO ROLLING STOCK OR EQUIPMENT OF THE ORDINARY INTERCHANGE THEREOF, THE ROLLING STOCK OR EQUIPMENT OF THE BUYER MAY BE REPAIRED BY OTHER ROADS. NO MATTER WHERE THE REPAIR PARTS ARE OBTAINED, AND THE BUYER SHALL HAVE THE SAME RIGHT TO REPAIR FOREIGN ROLLING STOCK OR EQUIPMENT UNDER SUCH INTERCHANGE. THIS AGREEMENT TO INCLUDE THE RIGHT ON THE PART OF THE BUYER, TO PURCHASE REPAIR PARTS IN ANTICIPATION OF BREAKAGE INSTEAD OF WAITING UNTIL THE BREAKAGE ACTUALLY OCCURS, BEFORE ORDERING THE REPAIR PARTS.

12. SHOULD ANY PORTION OF ANY SHIPMENT OF THE GOODS COVERED BY THIS ORDER BE FOUND AT DESTINATION NOT IN ACCORDANCE WITH SAID ORDER, AS TO QUALITY OR QUANTITY, THE RAILWAYS MAY, IF IT SEES FIT, USE SUCH PORTION OF SAID GOODS AS MAY SERVE ITS PURPOSE THAT ARE IN ACCORDANCE WITH THE ORDER, OR BE UNNECESSARILY, WITHOUT NOTIFICATION TO THE SELLER; AND SUCH USE SHALL NOT BE DEEMED AN ACCEPTANCE OF THE WHOLE, AS TO QUALITY OR QUANTITY AND SHALL NOT PREJUDICE THE RAILWAYS RIGHT TO REJECT THAT PORTION OF SAID GOODS AS ARE NOT IN ACCORDANCE WITH THE ORDER, OR TO RECOVER BACK FROM THE SELLER ANY AMOUNT ALREADY PAID FOR SUCH SHIPMENT.

13. ALL SHIPMENTS MUST BE ROUTED SO AS TO GIVE THE CANADIAN NATIONAL RAILWAYS, GRAND TRUNK RAILWAY SYSTEM OR CANADIAN GOVERNMENT MERCHANT MARINE THE LONGEST POSSIBLE HAUL.

THIS SHIPMENT IS ROUTED AS ABOVE IN ORDER THAT OUR LINES MAY SECURE A PROPORTION OF FREIGHT REVENUE, AND THIS FACT HAS BEEN TAKEN INTO CONSIDERATION IN PLACING THIS ORDER. IF SHIPMENT IS ROUTED OTHER THAN AS SHOWN ABOVE, SO THAT OUR LINES DO NOT PARTICIPATE IN THE REVENUE WITHOUT FIRST TAKING UP WITH THIS DEPARTMENT OUR COMPANIES' PROPORTION OF FREIGHT REVENUE VIA THE ROUTE SPECIFIED ON ORDER WILL BE DEDUCTED FROM YOUR INVOICE, IN ADDITION TO OTHER DEDUCTION WHICH MAY BE PROVIDED FOR.

STATEMENTS SHOWING DATES AND AMOUNTS OF ALL UNPAID INVOICES ARE TO BE SENT TO THIS OFFICE AS SOON AS POSSIBLE AFTER END OF MONTH.

The Instructions on the Back of the Purchase Order

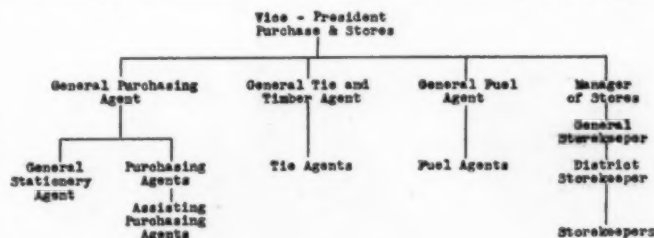
for the guidance of tracers. The purchasing department investigates unfilled stores stock orders when they become unduly outstanding. A standard tracing form is used but at times post cards, wire, letter or telephone are preferred.

The office copy of orders is ruled for a complete record of all deliveries and invoices applied. Orders are filed away first by stores, second, stores classification and, third, numerically. As soon as orders are filled they are transferred to a permanent "filled order file."

Advance stock orders based on previous consumption records have been found desirable where contracts are not necessary. These enable the manufacturer or supply house to prepare for requirements of material. Such orders do not specify deliveries, ordinary purchase orders being issued as the requisitions are filed. Such commitments are made at headquarters after anticipating the

requirements of each regional office and each region applies the purchase orders against them.

Copies of purchase orders issued in every region are sent to the general purchasing agent, where they are checked and compared and a tabulated statement of prices on the principal commodities purchased regionally is compiled monthly and distributed among the regions



Organization Chart of Supply Department

so that every region is kept informed of prevailing prices in other regions.

Contracts on commodities used in large quantities over the system are made at headquarters. These are usually on a yearly basis, and copies are distributed to the regions so that the purchase orders can be applied against them as the requisitions are received. Quarterly agreements on such items as wheels, tires, couplers, steel castings, etc., where the basic materials entering into their manufacture fluctuate more often, are made when this is considered more advisable than to make contracts over longer periods.

The standard invoice form was adopted shortly after its approval by the American Railway Association. Since the simplified invoice form has come into existence, firms are being urged to adopt this form. Fully 75 per cent of the invoices are now either on standard or simplified forms. The accounting system requires five copies of every invoice, but only three are certified. No invoice is passed until all details are checked and entered on the office copy of the order.

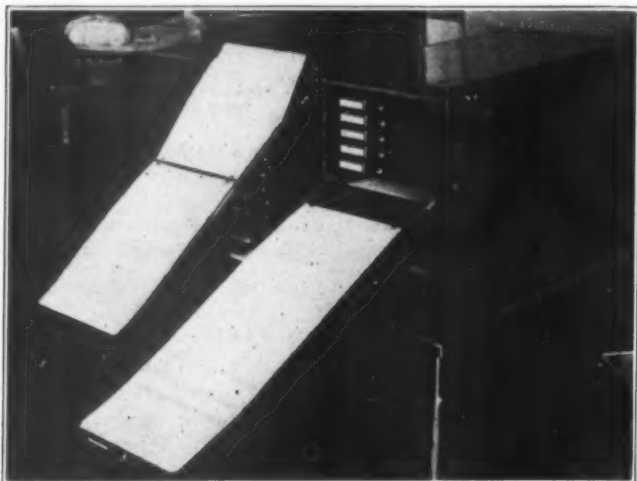
An accounting section is included in the purchasing department. This section records and distributes invoices to the using departments to obtain signatures for the receipt of goods, and vouchers all accounts covering purchases made. Invoices are filed by firm and date and are not numbered. A questionnaire, comprising a form on which the typical questions arising between a railroad and the supply house are tabulated, is considered essential to handle invoices. It is based on American Railway Association recommendations with a few modifications and additions, and its use practically eliminates correspondence in handling invoices.

Incoming and outgoing correspondence is not registered. As correspondence is received it is connected with its particular file under a commodity or general subject heading and, when answered, only one file copy is made. For several years each regional office maintained its own filing system of subjects and file numbers, but it became apparent that this could be simplified. All offices now have the same list of subjects and file numbers, which are permanent. The American Railway Association stores classification of commodities in a condensed form is taken as a basis for all files relating to commodities, and for files relating to general subjects, a special list of subjects was drawn up.

All commodity files are maintained and filed in the particular purchasing section handling such commodities, and the general files are maintained by a special clerk in filing cabinets used for that purpose only. One of the greatest benefits derived from this system is that all offices use the same subject and file number. In addition,

cross referencing is not necessary. The head office controls the key register and issues new subjects and file numbers when necessary.

Symbols consisting of a letter and a consecutive number are used on all wires between all departments, which eliminates unnecessary wording. These symbols are not used as file numbers, but are only for reference purposes when replies are requested.



Price Records Are Kept on Visible Index Cards Contained in Portable Steel Cabinets

Three statistical monthly statements are prepared. They are:

- (1) A statement of total purchases by firms to keep accurate record of the total business awarded each firm monthly and cumulatively.
- (2) A statement of total expenditures of 64 selected commodities for statistical records only.
- (3) A statement of office performance or statistical record, as approved by the American Railway Association, Division VI, purchasing department records, with certain modifications.

Price on Visible Cards

Price records are maintained on a visible index card system in steel cabinets containing 12 trays each, with capacity of 80 cards to a tray. These cards are indexed by the American Railway Association stores classification number and commodity. Every price is not necessarily recorded, only those for important purchases or those subject to market fluctuations need be entered. A cumbersome or elaborate price record system defeats itself, and the clerk in charge of each purchase section, therefore, uses his discretion as to what prices should be recorded. Each purchase section is equipped with two cabinets of 12 drawers each, which is ample to cover requirements.

The development of a mailing list was given much thought. Investigation showed that loose card systems are principally used, but are not effective; neither are they kept up to date. Leaf binders offer a more accessible record. They are indexed by commodities under numbered pages, with the names and addresses of firms listed and numbered consecutively under the commodities handled, the commodities being cross-indexed. Loose leaves allow for additions or alterations and the several copies from each binder can be collected and typed in one operation. The numbering of the firms from one up under each commodity is done so that the requisition marker only needs to write on the requisition the num-

bers selected from the mailing list for the stenographer to prepare the bids.

A complete index of all authorized specifications pertaining to commodities purchased is maintained in each purchase section and also an adequate supply of these specifications are filed in indexed folders and cabinets. Revised and new specifications are first filed at headquarters, which advises all sub-offices and furnishes copies for distribution among firms. The stores department follows the same method to afford a double check on all requisitions filed.

Office Machines Popular

The office layout has been given careful consideration. All desks in each section face one way and the individual clerks are allotted certain positions in order to save movement. Each office is fully equipped with fan-fold order machines, ordinary typewriters with line-a-times, dictaphones, adding machines, comptometers, steel filing cabinets, price record cabinets on castored tables, an envelope sealer and a ditto machine.

A reception room for the general public is supplemented in each case by an ante-room for the senior authorized staff to interview representatives of supply houses, the general offices being entirely shut off from public view.

A certain allotted space is provided on all forms for the name and address of the firm, or department to which it is sent, so as to get full advantage of window envelopes and avoid the necessity of addressing envelopes.

Educational classes for the staff have been formed in the purchasing department, principally to teach the ingredients and composition of materials, the methods and processes of manufacture, and the uses and requirements of the commodities purchased. Visits are made monthly to shops, stores, or manufacturing plants in the

ORDER NO. _____
REQ. NO. _____

GENTLEMEN:

WE ARE RETURNING YOUR INVOICE DATED _____
FOR REASON MARKED "X" BELOW, KINDLY ADJUST AND RETURN THIS PROOF
AMOUNT _____
WITH YOUR REPLY ATTACHING ENCLOSURES, IF ANY

1	BILL OF LADING OR EXPRESS RECEIPT REQUIRED	
2	SHOW CORRECT ORDER AND REQUISITION NUMBER	
3	FIVE COPIES OF INVOICE REQUIRED	
4	THREE CERTIFIED COPIES OF CUSTOMS INVOICES REQUIRED	
5	RENDER SEPARATE INVOICE FOR EACH ORDER	
6	FREIGHT OR EXPRESS RECEIPT SUPPORTING PREPAID CHARGES REQUIRED	
7	PRICE INCORRECT SHOULD BE _____	
8	DISCOUNT _____	
9	LIST PRICE _____	
10	EXTENSION _____	
11	ADDITION _____	
12	TERMS OF DELIVERY INCORRECT _____	
13	ORDER DOES NOT COVER MATERIAL AS INVOICED PLEASE EXPLAIN _____	
14	ORDER OVERSHIPPED PLEASE EXPLAIN _____	
15	PLEASE SEND _____ TO ADJUST	
16	SHOW CAR NUMBERS AND INITIALS _____	
17	HAVE REQUISITION MADE TO COVER OR QUOTE NO. _____	
18	SHOW DESTINATION AND COMBINE _____	
19	SHOW TERMS OF DISCOUNT _____	
20		
21		
22		

A Questionnaire Form for Handling Invoices Saves Correspondence

vicinity, and papers are compiled and read by members of the staff at the "educational club" meetings. The visits are planned so that competent officers accompany the classes during these visits. A mental picture of the material or commodity in its manufacture and ultimate use increases the ability to purchase, from both a price and delivery standpoint. Staff meetings and meetings of the senior representatives from the various regional offices are also held periodically to improve acquaintanceship, to co-ordinate ideas, discuss problems and build up a uniform system of operation. These have proved beneficial in many respects. The best trade journals and publications relating to railway operation in its many departments are also accessible to all members of the staff.

Lehigh & New England

Road favored as an originator of traffic by many connections—Earned nearly \$8 on \$50 par stock

IT is a fair question whether the railway executives who have been trying to arrange for the allocation of the smaller railroads in trunk line territory may not find a degree of difficulty in providing for the place of the Lehigh & New England entirely out of proportion to the mileage of this interesting and prosperous property. This statement is made with a certain presumption that may or may not be justified. The Lehigh & New England is not now an independent railroad. It is controlled through ownership of all its outstanding capital stock by the Lehigh Coal & Navigation Company. The Coal Company may feel that it would prefer to retain the railroad as an outlet for its extensive anthracite coal operations in the Lehigh district of Pennsylvania. On the other hand, it is in the record that the Coal Company was willing at one time to forego the pleasures of being in the railroad business. Its proposed lease of the Lehigh & New England to the Reading, however, failed to secure the approval of the Interstate Commerce Commission.

The Commission's decision in the last mentioned proceeding emphasized how desirable the acquisition of the Lehigh & New England might prove to be to various railroads. The Baltimore & Ohio interceded in the Reading's favor. The Pennsylvania offered very strong objection. The Commission itself quoted from Professor Ripley's report on railroad consolidations something to the effect that possibly the most logical parent company for the Lehigh & New England might well be the New Haven. At any rate the Commission decided that there was no reason for haste and suggested that final decision in the matter could with propriety be withheld until the merger plans for eastern territory had approached fruition. It also said that the rental that the Reading proposed to pay was too high and might prove too much of a burden for the latter. The Commission's decision was published in March, 1927, a short while before the Lehigh & New England's 1926 net income had been announced. It is of more than passing interest that in both 1926 and 1927—neither properly to be designated as a good year for an anthracite carrier—the Lehigh & New England's net income exceeded the amount that the Reading was willing to pay as rental.

The Lehigh & New England has had an extremely interesting history, in which respect it is quite like all the other anthracite carriers or like its parent company, the Lehigh Coal & Navigation Company. It had its inception in two separate enterprises; one in New Jersey and the other in Pennsylvania. The former was the Boston & South Mountain, organized in 1873, which subsequently became the Pennsylvania & New England—New Jersey Division. The Pennsylvania enterprise was the Delaware & Slatington, organized in 1881. The two companies were merged in 1882 under the name of the Pennsylvania, Slatington & New England. This company suffered receivership and was reorganized in October, 1887, as the Pennsylvania, Poughkeepsie & Boston. The last named was able to avoid the sheriff only a short while, as evidenced by the fact that it was sold at foreclosure in January, 1895, and reorganized on April 2, 1895, as the Lehigh & New England. The new company apparently had some difficulty getting under way; for a while its line in Pennsylvania was operated by the Lehigh Valley, while the New Jersey division was operated

by the New York, Susquehanna & Western. It gradually regained its independence and had become a going concern when, in 1904, it was acquired by the Lehigh Coal & Navigation Company.

A book could be written about the various transportation ventures of the Lehigh Coal & Navigation Company. This company started out in 1818 as the Lehigh Coal Company and the Lehigh Navigation Company, the two being combined in 1820 under the name of Lehigh Navigation & Coal Company, changed in 1821 to the present name under which it was incorporated February 13, 1822. At one time the present company used to mine coal in the Wyoming region, transport it up inclines in the neighborhood of Wilkes-Barre, run it down a gravity railroad to the Lehigh river at Whitehaven and then transport it by canal to the Delaware river at Easton. It later paralleled the canal with a railroad known as the Lehigh & Susquehanna. The canal is still in operation between Siegfried and Bristol, but since 1871 the railroad has been operated by the Central of New Jersey under lease for the duration of the company's charter. The company at about the same time that this lease was effected, found itself financially embarrassed and sold its coal properties in the Wyoming district to the coal mining subsidiary of the Jersey Central—the Lehigh & Wilkes-Barre Coal Company—which was segregated only a few years ago. From that time on the Lehigh Coal & Navigation Company confined its coal operations to the Lehigh district, depending upon the Jersey Central and other carriers for the transportation of its coal to the New York market and, as the canal became less useful, to the Philadelphia market, also.

It appears that at about the beginning of the century the Coal Company began to feel the need for additional markets. In pursuance of this realization, it acquired, in 1904, the Lehigh & New England, which at that time extended from Slatington, on the Lehigh river, to a connection with the New Haven at Campbell Hall, N. Y., with a branch from Pen Argyl and Bath, Pa., to Martin's Creek. Acquisition of the railroad made available to the coal company a new outlet to New England markets via the Poughkeepsie Bridge route. The line to Martin's Creek, above mentioned—the Northampton Railroad—had been acquired in September, 1903. In October, 1904, the L. & N. E. made a further important acquisition in the form of the Lehigh & Delaware and the Wind Gap & Delaware, extending from Bangor to Bethlehem. It is this branch which now serves the extensive cement industry which ships a large proportion of its output over the Lehigh & New England.

The Lehigh Coal & Navigation Company had reason to be dissatisfied with the means at its disposal to put its coal tonnage on its railroad. Accordingly, it determined to extend the Lehigh & New England to its coal operation, which it did in 1912 by building an extension from Danielsville to Tamaqua in the heart of the Lehigh coal district, at which point connection was made with the line serving the several Lehigh Coal & Navigation coal operations. This line, known as the Panther Creek, extended from Tamaqua to Hauto, and was turned over to the Lehigh & New England by the Coal Company in November, 1913. A further extension was completed to Nesquehoning in 1915, which is of interest because it closely parallels the Nesquehoning Valley, a railroad

owned by the Coal Company, which, as a part of the Lehigh and Susquehanna, is leased to the Jersey Central for 999 years. The Crane Railroad to Catasauqua was acquired in July, 1914.

The Lehigh & New England in its present form operates a total of 217 miles of railroad. Included in this total are 35 miles of trackage rights; namely, from Hainesburg Junction, N. J., to Swartswood Junction, over the New York, Susquehanna & Western, 18½ miles, and from Pine Island Junction, N. Y., to Campbell Hall, over the Erie, 17 miles. The company's trains have operating rights over the New Haven from Campbell Hall into the terminal at Maybrook, 3 miles.

The company has the good fortune to be able to originate about 66 per cent of its total tonnage. It carries three leading classes of traffic: anthracite coal, nearly all of which it originates; bituminous coal, none of which it originates, and cement, most of which it originates. The company also does a sizable business in zinc products which it receives from the New Jersey Zinc Company plant at Palmerton, Pa. It serves the most extensive slate deposits in the country at Bangor, Pa., Pen Argyl, etc. The company handles very little passenger business.

Ordinarily, anthracite coal constitutes slightly less than one-half the total revenue tonnage. In 1927 the anthracite tonnage percentage of total freight traffic was 40 per cent, and it yielded 42.09 per cent of the total revenues from all sources. This coal comes chiefly from the Lehigh Coal & Navigation collieries in the neighborhood of Tamaqua. A large proportion of it is turned over to the Central of New Jersey at Hauto, the Reading at Tamaqua, the Lehigh Valley at Lizard Creek Jct., the Erie at Goshen, some is delivered to the Pennsylvania at Martin's Creek and a substantial volume moves to Campbell Hall and Maybrook for the New England market. The bituminous coal is almost entirely from mines on the Baltimore & Ohio, Western Maryland and Pennsylvania. It comes to the Lehigh & New England via the Reading at Catasauqua or, possibly, from the Central of New Jersey at Bethlehem. A large proportion of the bituminous coal is destined to the cement plants and most of the remainder is moved to Campbell Hall and Maybrook for delivery to the Ontario & Western and the New Haven. The bituminous has shown a substantial increase year by year, the tonnage in 1927 being about three times that of 1916. In 1927 it constituted 22½ per cent of the total revenue tonnage and supplied 14 per cent of the total revenues.

The Lehigh & New England serves 10 large cement plants which supplied in 1927 about 1,800,000 tons of traffic. This was 22 per cent of the total tonnage and supplied about the same proportion of the total revenues. The plants are situated in what is known as the Trenton limestone ridge and center in a comparatively small area in the neighborhood of Bath, Nazareth and Martin's Creek. The tonnage moves via various outlets, its peculiarity being that shippers require for it the most expedited service—overnight delivery at New York, or second morning at Boston.

The Lehigh & New England appears to the observer to be a much higher grade property than one would expect considering the fact that it handles practically no passenger business. Most of its main line is laid with 100-lb. rail. It will this year put in 5 miles of 130-lb. section on a bad 2.75 per cent grade on the Bethlehem branch. On the main-line and important branches, 85 per cent of the ties are creosoted and 65 per cent of all the ties, inclusive of those in yard tracks and sidings. Most of the ties in running tracks are tie-plated as well as a goodly proportion of the ties on passing tracks and

in yards. The ballast is cinders or zinc chats from Palmerton. The ballast is not lined but the track line and surface are approximately up to passenger track standards. Concrete or concrete and steel bridges are the rule. The high standards of maintenance explain the economical maintenance of way ratio of 11.07 in 1927.

From an operating standpoint the road has a serious difficulty in the terminal character of its business and its inability to secure long engine districts. The chief classification center is at Pen Argyl. From the anthracite coal district to Pen Argyl is only 55 miles. The new yard at Tadmor is the chief assembly point for cement and is only 17 miles distant. Even from Pen Argyl to Maybrook is only 77 miles. The road gets around this condition by extensive use of turn-around runs, but it is handicapped by inability to build up heavy train loading or a substantial figure of gross ton-miles per freight train-hour. Its standard freight engine is the Consolidation, of which it has 47 of its total number of 69 units. These range from 32,000 lb. to 41,000 lb. tractive force, except for four of 50,000 and seven of 68,000. The road at the present time has two heavy Decapod type locomotives, one of 90,000 lb. tractive force and the other with a booster which, with the latter, can produce 106,000 lb. tractive force. There are various places on the line where grades in excess of 1 per cent are encountered and on the Bethlehem branch a grade of 2.75 per cent against the current of traffic exists. The road has sufficient freight car equipment so that it always reports a credit per diem balance.

That the operation is successful is indicated by the subjoined earnings statement for 1927. The road reported net income in 1927 of \$7.96 per share on its outstanding \$50 par value stock. In 1926, net income was \$9.81 per share. The company pays \$5 per share, or 10 per cent dividends, all of which accrue, of course, to the Lehigh Coal & Navigation Company. It is this combination of substantial earnings, the sizable volume of originated tonnage, and the numerous connections or outlets—23 in number—that make the Lehigh & New England such a desirable acquisition by the larger systems; provided, as previously remarked, the Lehigh Coal & Navigation Company may once more want to retire from the railroad business.

Lehigh & New England Income Statement 1927 and 1926

	1927	1926	+ Increase or —Decrease
Railway operating revenues:			
Freight:			
Anthracite coal	\$2,440,296	\$2,527,353	—\$ 87,057
Bituminous coal	833,891	818,052	+ 15,839
Cement	1,300,772	1,189,653	+ 111,119
Merchandise	1,108,713	1,013,481	+ 95,232
Passenger	13,978	15,433	— 1,455
Mail	696	707	— 11
Express	2,057	2,512	— 454
All other transportation	64,767	57,061	+ 7,706
Incidental	33,284	38,076	— 4,792
Total railway operating revenues	5,798,454	5,662,328	+ 136,126
Railway operating expenses:			
Maintenance of way and structures	641,674	593,650	+ 48,024
Maintenance of equipment	1,230,010	1,153,708	+ 76,301
Traffic	65,589	64,157	+ 1,432
Transportation	1,927,505	1,716,128	+ 211,377
General	198,165	176,133	+ 22,033
Transportation for investment—Cr... ..	25,718*	4,951*	— 20,767
Total railway operating expenses	4,037,225	3,698,825	+ 338,400
Ratio of operating expenses to operating revenues	69.63%	65.32%	+ 4.31%
Net revenue from railway operations	1,761,228	1,963,503	— 202,274
Railway tax accruals	249,416	294,804	— 45,389
Uncollectible railway revenues	138	380	— 241
Total railway tax accruals	249,554	295,184	— 45,630
Total railway operating income	1,511,675	1,668,319	— 156,644
Total nonoperating income	85,568	190,075	— 104,507
Gross income	1,597,242	1,858,394	— 261,151
Total deductions from gross income	516,060	494,349	+ 21,711
Net income	1,081,183	1,364,044	— 282,862
Income applied to sinking and other reserve funds	8,731	8,920	— 189
Balance transferred to profit and loss	1,072,451	1,355,125	— 282,673

* Credit.

Hearing on Trucking in New York

Railroads complete their case—Trucking contractors and Port Authority favor retention

EVIDENCE presented by the respondent carriers was completed during the May 31 sessions of the Interstate Commerce Commission investigation into freight trucking in New York after a succession of railway witnesses had occupied the stand for the six hearing days following the opening of the case on May 22. The hearings have been held at the New York State Chamber of Commerce building, New York, with Commissioner Porter and Attorney-Examiner Ames presiding. Earlier testimony was reported in last week's *Railway Age*. Witnesses of the Baltimore & Ohio and New York Central offered the concluding railway testimony, which was followed first by the evidence of the Terminal Truckmen's Conference and then by the case of the Port of New York Authority.

The Baltimore & Ohio operates no inland stations, but joins the other roads on the west bank of the Hudson in the move to discontinue constructive station operation and limit trucking in lieu of lighterage to transfer of freight between railways or delivery to steamship piers. This limitation would serve to prevent constructive delivery through a lighterage point. The New York Central, which has neither inland nor constructive station tariffs, favors the limitation of trucking in lieu of lighterage.

The Terminal Truckmen's Conference, an organization of railway contract truckmen, favors the retention of the constructive station deliveries while Billings Wilson, deputy manager, Port of New York Authority, stated, in the course of his direct testimony, that constructive station operation should be encouraged, since he is convinced that such operation is sound in principle and is undoubtedly the cheapest method for the delivery of carload freight.

Testifying for the Baltimore & Ohio, W. G. Curren, general manager, New York terminal lines, commenced with a description of the Manhattan facilities of that road and continued to outline its trucking activities. The witness stated the position of his company to be in agreement with that of the other roads entering the New Jersey side. Mr. Curren stated that his road proposes to handle present constructive station tonnage through its pier stations which are now being used to but 65.5 per cent of capacity.

Cross-examination of Mr. Curren followed the same lines as did questions asked preceding railway witnesses by representatives of the several participants to the proceedings.

During the cross-examination the witness agreed that a free lighterage point amounts, in effect, to a constructive station when freight is trucked past that point to the consignee. Several questions were asked concerning the warehouse operations of a Baltimore & Ohio subsidiary but the witness was unable to answer, other than to reiterate an assertion that he knew nothing of these storage activities which were entirely outside his jurisdiction.

General-Attorney C. R. Webber (B. & O.) objected to this line of questioning and after some discussion of the point by different counsel, Examiner Ames pleaded for a "constructive hearing on constructive stations" as he asked that cross-examination be confined within cross-examination limits. The particular

issue, however, was settled when Mr. Webber agreed to supply the record with copies of the Baltimore & Ohio contracts with its warehouse operating subsidiary.

W. F. Richardson, freight traffic manager, Eastern Lines, was called to answer Attorney-Examiner Harry C. Ames' inquiry into the origin of the practice whereby freight was trucked beyond the lighterage point, without unloading, under the trucking in lieu of lighterage provision of the tariff. Mr. Richardson said the practice was inaugurated in order to regain some lost traffic after his department was legally advised that freight could be handled in that manner under the tariffs.

Woodruff Testifies for New York Central

With the opening of the afternoon session on May 31 G. C. Woodruff, assistant freight traffic manager, New York Central, presented the evidence of that road. Like his predecessors on the stand, he described his company's Manhattan facilities but, unlike most of the other roads, the New York Central has neither inland nor constructive stations.

The witness stated that his road has done trucking in lieu of lighterage for at least eight or ten years, although the carrier's option to transfer freight in this manner was not stipulated in the tariff until 1926 when its right of choice was disputed in the case of a shipment so handled. Thus the decision of the New York Central to include the provision for trucking in lieu of lighterage in the tariff was a result of this dispute and had no connection with similar action on the part of other roads, according to the witness. The road has now filed a supplement to this tariff, limiting lighterage trucking to interchange between rail and steamship lines.

Mr. Woodruff further testified that unrestricted trucking in lieu of lighterage made possible, in practice, the handling of freight through a multiplicity of constructive stations. He added that his checks developed that most truckmen actually went to the lighterage point before proceeding to deliver to the consignee while those who were found not doing so had their contracts cancelled.

Cross-examination by P. McColleston, representing the Newspaper Publishers Association, brought out the fact that the New York Central proposed to continue trucking in lieu of lighterage as it is now carried on in the case of traffic originating in New England. This exception, according to the witness, was made to meet the competition of the New York, New Haven & Hartford which has not joined the other roads in the move to discontinue the constructive station practice. Mr. Woodruff had previously testified that the New York Central has lost 1290 tons of newsprint paper traffic per week to the New Haven which road he claimed delivers this freight through its 59th street constructive station.

Wilber LaRoe, Jr., of counsel for the Port of New York Authority, brought out the fact that the New York Central engages 34 truckmen under contract to do its trucking in lieu of lighterage. After brief questioning by Examiner Ames on the practice of trucking to the receiver through a lighterage point the witness was excused.

W. P. Eagleston, acting agent, Long Island, offered

brief testimony to explain the trucking activities of that road. He explained that the truck services of this carrier are in the nature of substitutes for rail operations and are confined entirely to intra-railroad points, with no trucking in lieu of lighterage nor constructive or inland stations. After brief cross-examination by Mr. LaRoe of the Port Authority and Examiner Ames, this witness was also excused.

H. E. Manden, counsel for the Terminal Truckmen's Conference, then opened the case for his organization with a brief statement. Practically all of the truckmen who have railway contracts, he said, were members of the conference. A. E. Boone of the Horstmann Trucking Corporation and a member of the committee appointed by the conference to handle the case was called to the stand.

The witness first declared that self-preservation and a feeling that the services are in public interests prompted his committee to ask a permanent suspension of the tariffs which propose a discontinuance of the constructive stations together with a limitation of trucking in lieu of lighterage. Mr. Boone's company has contracts with the New York Central and Central of New Jersey. He explained a typical movement of freight under each of these contracts and stated that checks of drivers are made to see that contracts are observed.

He was questioned by Mr. LaRoe of the Port Authority on rates charged consignees for the movement past the constructive station line and lighterage points. W. H. Chandler of the Merchants Association then inquired into the witness' experience with loaders at the piers.

Final questions of the day were put to the witness by John F. Finnerty, representing Brooklyn Eastern District Terminal, who sought information on minimum rates charged for delivery through constructive stations or constructive delivery through lighterage points.

Re-direct examination of Mr. Boone at the opening of the June 1 sessions placed into the record estimated figures on the questions into which Mr. Finnerty desired to inquire. It was developed that of the 108 different railroad patrons which Mr. Boone's company has served, sixteen have received a rate of less than four cents per 100 lb. for the movement beyond the point to which the railway pays the trucking charge, i.e. the lighterage point. Four of the sixteen had accepted trailer delivery without unloading service at a two cent rate.

During Mr. Finnerty's cross-examination, designed to bring out trucking cost figures more definite than the submitted estimates, Examiner Ames remarked that he did not care to require the witness to reveal detailed costs before a group of competitors, but added that the more he thought of the case, the more he was inclined to think that the Interstate Commerce Commission would have to enter upon a cost study of these trucking operations.

After brief questioning of Mr. Boone by railway counsel and representatives of other participants, Examiner Ames took up the inquiry. He first brought out that the Horstmann Trucking Corporation receives a flat 8½ cents per 100 lb. from the New York Central for trucking in lieu of lighterage to any part of Manhattan. The examiner next asked if a higher rate paid by one carrier for such service would influence the truckman in the solicitation of freight for that road. The witness admitted that it would. Further questions were concerned with a typical movement of freight through a lighterage point when the ultimate destination of that freight must be passed en route in

order to observe the tariff. The witness agreed that there would be economy in a more direct operation to destination. He told the examiner, in answer to a final question, that in his opinion the establishment of the constructive stations had relieved congestion at the piers.

The Port of New York Authority then opened its case with evidence from a series of railway patrons who testified to a preference for the constructive station arrangements over the former operations at the piers. Each of these was cross-examined briefly and following their testimony J. McKenzie, deputy commissioner of docks, New York City, was called to the stand. This witness testified that the city has unfilled applications for pier sites from steamship companies which it is now unable to accommodate. In response to H. W. Bikle, general attorney of the Pennsylvania, however, Mr. McKenzie stated that he would take no stand as to what is a proper use of the piers.

B. F. Fitch, president of the Motor Terminals Company, followed Mr. McKenzie in the witness chair. Mr. Fitch, who has made studies of the New York terminal situation was described by Wilbur LaRoe, Jr., of counsel for the Port Authority as being more or less the father of these trucking practices. The witness first described the situation in Cincinnati where he is associated with terminal freight trucking operations. In his examination of Mr. Fitch, Mr. LaRoe quoted from former speeches and reports of the witness and called for comment on such quotations.

The witness conceded it to be his opinion that a return to pier operations would be a backward step, inasmuch as he regarded it uneconomical to handle freight any oftener than is necessary. He had previously agreed that pier station handling involves at least one loading additional to that required for delivery required through a constructive station.

When asked about store-door delivery, Mr. Fitch stated that much confusion has grown around the use of the term which he considers to have become a slogan. He would prefer to see a program before making a pronouncement. Examiner Ames asked a few questions of the witness and the hearing was adjourned for the day.

Port Authority Presents Detailed Case

At the opening of the June 2 session, Deputy Manager Wilson of the Port Authority took the stand. He outlined the history of terminal development in New York from the time of the first rail approaches to the city. The witness developed the evolution from the first steamboat service between the metropolitan area and outlying terminals, through the beginnings of lighterage and car float operations down to the inauguration of transfer by motor truck. Mr. Wilson said the first car float made its appearance in 1866 and continued to say that there has been no change in the method of transfer since that time.

The witness further testified that the motor truck is now able to give, to New York City, terminal delivery of freight without congestion at the waterfront. A series of exhibits relating to Manhattan rail and pier facilities was next introduced and discussed at some length. It was brought out here that 35 per cent of the berth space south of 72nd street on Manhattan is occupied by the railways for the handling of domestic freight.

Mr. Wilson next turned his attention to the inland stations now operated by some of the roads. He considered these facilities a step in the right direction inas-

much as they tended to divert freight from the waterfront. The witness proceeded to describe the proposed universal inland station with truck connection to rail terminals which is contemplated as the first of a series in the Port Authority's plan for Manhattan freight service. He stated that plans for this facility have been prepared and sites surveyed. It is proposed to make available space for all carriers at less than their costs at the piers. The witness stated that the New York Terminal problem cannot be solved without the use of motor trucks and held that the railways could perform the service to the universal station with their own trucks. Trucking operations, he continued, are the same in principle as lighterage operations.

Mr. Wilson was cross-examined briefly by W. H. Chandler of the Merchants Association and at some length by H. W. Bikle, general attorney of the Pennsylvania in addition to questioning by other participants. It was developed during the course of such questioning that the Port Authority favors store-door delivery at the option of the patron. The witness, however, believed that in constructive station service the consignee should pay 2 cents per 100 lb. additional to the railroad in compensation for relief from the expense of loading the trucks. In announcing that the hearing would recess until Thursday, June 7, Examiner Ames asked railway counsel to supply, for the record, tonnage figures of freight into Manhattan during the past three years, separated as between the different methods of handling. The June 7 session was scheduled to be held at the headquarters of the Port of New York Authority.

Average Tons Per Car in 1927

WASHINGTON, D. C.

A list of 76 Class I railroads that showed an improvement in 1927 as compared with 1923 in the average tons per car of freight originated and of 48 that showed decreases in the average, is given in a special commodity loading statement compiled by the Car Service Division of the American Railway Association showing the progress made in this direction in the years 1923 to 1927. The compilation shows the average tons per car of the various classes of freight in the Interstate Commerce Commission Commodity classification for railroads originating 500 or more carloads of specified commodities in 1927.

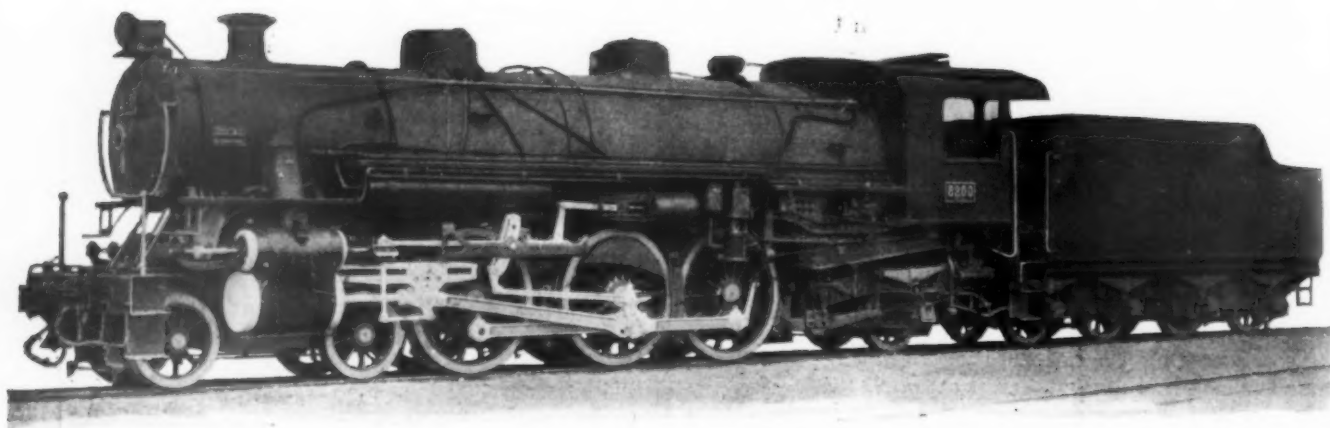
The average for these roads for all carload traffic in 1927 was 35.1 tons, the same as that for 1926. In 1925 the average was 34.4 tons, in 1924 it was 34 tons and in 1923 it was 34.5 tons.

One part of the compilation lists the railroads in the order of the tonnage for each commodity, while the second part gives lists in the order of the increase in average tons per car in 1927 as compared with 1923. The table showing the increases or decreases in tons per car for all carload traffic in 1927 as compared with 1923 follows:

Total All Carload Freight Traffic Originated—Class I Roads

	Number Carloads	Av. Tons Per Car	Av. Tons Per Car	Inc. or Dec.
	1927	1927	1923	
1 Monongahela	339,278	57.9	48.3	+ 9.6
2 L. H. & St. L.	15,041	30.6	22.6	+ 8.0
3 S. A. U. & G.	19,430	27.1	20.1	+ 7.0
4 K. C. M. & O.	78,140	29.6	23.1	+ 6.5
5 Detroit & Mac.	20,763	37.4	31.7	+ 5.7
6 Tenn. Cent.	31,521	36.9	32.1	+ 4.8
7 St. J. & G. I.	11,904	25.4	21.2	+ 4.2
8 P. & L. E.	338,598	44.8	40.9	+ 3.9
9 Virginian	181,370	62.5	58.8	+ 3.7
10 N. & W.	804,335	53.7	50.2	+ 3.5
11 Ulster & Del.	834	24.6	21.1	+ 3.5
12 Ft. S. & W.	10,556	28.2	24.9	+ 3.3
13 A. C. L.	591,419	27.0	23.8	+ 3.2
14 L. & N.	1,309,765	41.9	38.7	+ 3.2

	Number Carloads	Av. Tons Per Car	Av. Tons Per Car	Inc. or Dec.
	1927	1927	1923	
15 D. T. & I.	94,473	29.6	26.4	+ 3.2
16 N. O. G. N.	48,820	32.8	29.9	+ 2.9
17 Central Vt.	35,230	24.4	21.7	+ 2.7
18 C. & O.	1,234,750	49.9	47.4	+ 2.5
19 D. & I. R.	149,893	49.3	46.9	+ 2.4
20 B. & L. E.	61,525	46.0	43.8	+ 2.2
21 Cinn. Nor.	25,615	36.9	34.7	+ 2.2
22 C. & N. W.	1,070,000	33.8	31.7	+ 2.1
23 S. A. L.	412,545	29.7	27.6	+ 2.1
24 Wabash	265,811	27.4	25.4	+ 2.0
25 M. V.	55,880	31.8	29.8	+ 2.0
26 U. P. System	708,703	33.0	31.1	+ 1.9
27 A. & W. P.-W. of A.	39,162	31.1	29.3	+ 1.8
28 Norfolk Sou.	100,717	27.2	25.5	+ 1.7
29 I. G. N.	83,535	25.1	23.4	+ 1.7
30 Long Island	56,748	25.6	23.9	+ 1.7
31 C. R. I. & P.	715,493	28.4	26.8	+ 1.6
32 B. & Maine	251,533	22.0	20.4	+ 1.6
33 B. R. & P.	198,271	44.0	42.4	+ 1.6
34 D. & T. S. L.	18,956	23.6	22.0	+ 1.6
35 F. E. C.	72,224	23.8	22.3	+ 1.5
36 Pitts. & Shaw	53,001	52.4	50.9	+ 1.5
37 B. & Albany	85,238	24.6	23.2	+ 1.4
38 C. & W. C.	27,327	24.2	22.8	+ 1.4
39 C. St. P. M. & O.	205,205	26.7	25.4	+ 1.3
40 La. & Ark.	52,284	29.4	28.1	+ 1.3
41 Reading Co.	591,372	40.1	38.9	+ 1.2
42 Mich. Cent.	456,727	23.2	22.0	+ 1.2
43 Maine Cent.	124,091	25.2	24.0	+ 1.2
44 D. S. S. & A.	71,302	38.1	36.9	+ 1.2
45 St. L. S. F.	551,855	32.0	30.9	+ 1.1
46 St. L. S. W.	113,611	26.8	25.7	+ 1.1
47 Ill. Cent. Sys.	1,206,263	34.0	33.0	+ 1.0
48 N. Y. C. & St. L.	243,395	26.3	25.3	+ 1.0
49 Texas & Pac.	217,366	26.2	25.2	+ 1.0
50 C. B. & Q.	878,443	30.3	29.4	+ .9
51 G. N.	711,365	40.5	39.6	+ .9
52 M. K. T. Lines	274,477	26.7	25.8	+ .9
53 A. T. & S. F. Sys.	1,224,589	30.3	29.5	+ .8
54 Lehigh Valley	417,093	40.8	40.0	+ .8
55 M. St. P. & S. S. M.	347,139	32.5	31.7	+ .8
56 N. Y. N. H. & H.	346,363	23.3	22.5	+ .8
57 N. Y. O. & W.	72,084	38.4	37.6	+ .8
58 D. M. & N.	371,413	51.5	50.8	+ .7
59 Western Md.	171,411	44.4	43.7	+ .7
60 G. C. Lines	70,303	25.0	24.3	+ .7
61 Colo. & Sou.	87,480	37.1	36.5	+ .6
62 P. S. & N.	20,806	36.4	35.8	+ .6
63 D. & H.	333,744	42.3	41.8	+ .5
64 Cumb. & Pa.	30,454	50.7	50.2	+ .5
65 N. C. & St. L.	146,726	28.2	27.8	+ .4
66 C. I. & L.	107,125	36.4	36.0	+ .4
67 Nevada Nor.	2,443	42.2	41.9	+ .3
68 Nor. Pac.	514,916	32.5	32.3	+ .2
69 D. L. & W.	448,676	39.3	39.1	+ .2
70 N. W. Pac.	51,721	23.0	22.8	+ .2
71 Georgia & Fla.	19,831	23.2	23.0	+ .2
72 B. & O.	1,673,788	40.2	40.1	+ .1
73 Mo. Pac.	810,177	30.3	30.2	+ .1
74 D. & R. G. W.	205,979	36.6	36.5	+ .1
75 C. G. W.	107,488	21.0	20.9	+ .1
76 L. R. & N. Co.	48,525	26.2	26.1	+ .1
77 Southern Sys.	980,920	30.3	30.4	— .1
78 P. M.	334,136	26.9	27.0	— .1
79 Central of Ga.	187,421	25.7	25.8	— .1
80 Montour	62,196	49.8	49.9	— .1
81 Georgia	39,157	25.6	25.7	— .1
82 Spokane Int.	17,059	31.9	32.0	— .1
83 Ft. W. & D. C.	62,714	25.7	25.9	— .2
84 G. B. & W.	12,516	22.9	23.1	— .2
85 K. C. S.	71,676	29.7	30.0	— .3
86 B. & Aroos.	68,820	22.6	22.9	— .3
87 Western Pac.	62,796	27.1	27.4	— .3
88 M. & N. A.	10,158	23.8	24.1	— .3
89 C. M. & St. P.	1,052,973	30.7	31.1	— .4
90 C. R. R. of N. J.	444,887	35.9	36.3	— .4
91 E. J. & E.	396,440	43.7	44.1	— .4
92 G. T. W.	191,218	16.6	17.0	— .4
93 S. P. & S.	27,161	29.5	29.9	— .4
94 Erie	623,774	33.1	33.7	— .6
95 S. P. in T. & L.	340,096	28.0	28.6	— .6
96 Utah Ry.	34,743	48.4	49.0	— .6
97 C. C. C. & St. L.	435,373	33.2	33.9	— .7
98 Col. & Green	19,004	26.0	26.7	— .7
99 S. P. (Pacific)	1,041,383	30.1	30.9	— .8
100 A. B. & C.	42,586	24.6	25.5	— .9
101 D. & S. L.	29,163	35.4	36.5	— 1.1
102 T. P. & W.	16,460	32.3	33.4	— 1.1
103 N. Y. C.	1,071,304	29.2	30.4	— 1.2
104 G. M. & N.	59,805	26.1	27.3	— 1.2
105 Bingham & Gar.	19,527	63.5	64.7	— 1.2
106 L. & N. E.	118,935	45.4	46.7	— 1.3
107 Penna. System	3,176,979	37.6	39.0	— 1.4
108 K. O. & G.	13,873	35.0	36.4	— 1.4
109 Buffalo & Sus.	24,280	44.2	45.7	— 1.5
110 C. & E. I.	179,958	36.7	38.5	— 1.8
111 Clinchfield R. R.	85,041	42.1	43.9	— 1.8
112 M. & St. L.	120,988	27.0	28.9	— 1.9
113 P. & W. Va.	68,898	48.2	50.2	— 2.0
114 Miss. Cent.	22,143	24.9	27.6	— 2.7
115 H. V.	60,951	40.8	43.6	— 2.8
116 M. & O.	128,381	26.5	29.5	— 3.0
117 Rutland	16,230	22.8	25.9	— 3.1
118 Ann Arbor	16,323	25.3	28.9	— 3.6
119 L. & H. R.	21,626	37.2	41.2	— 4.0
120 C. & A.	174,491	28.6	32.7	— 4.1
121 W. & L. E.	190,637	41.1	47.3	— 6.2
122 R. F. & P.	16,361	28.4	35.0	— 6.6
123 T. & B. V.	10,614	24.2	31.1	— 6.9
124 Mineral Range	10,844	30.7	42.7	— 12.0
Total	35,159,453	35.1	34.5	



A Three-cylinder Pacific for Passenger Service

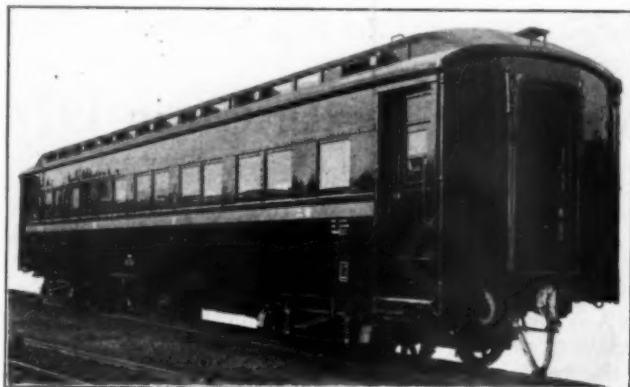
Post-Earthquake Progress in Japan

Earthquake has not curtailed development program, including new lines and electrification

RAPID revival of traffic following the disastrous earthquake-fire of September, 1923, enabled the Imperial Japanese Government Railways to report net earnings equivalent to \$52,059,700 for the fiscal year 1923-1924, while at the same time the work of rehabilitating the wrecked facilities continued at a rapid rate and business was handled without confusion.

These roads have continued to report increasing net earnings in the years since the catastrophe with the exception of the fiscal year 1926-1927 when increased operating costs and other expenses more than offset the

tions besides wrecking 32 others, while the damage list of rolling stock comprised 48 locomotives, 424 passenger cars, 32 electric cars and 971 freight cars,



Second Class Passenger Car

Financial Results	1923-24	1924-25	1925-26	1926-27
Operating Revenue...	\$209,263,456	\$222,279,523	\$226,938,879	\$228,487,155
Operating Expenses...	123,306,342	125,661,790	122,455,547	127,836,006
Operating Profit.....	85,957,114	96,617,733	104,483,332	100,651,149
Other Expenses.....	33,897,402	35,343,007	36,865,231	38,862,912
Balance (Net).....	52,059,712	61,274,726	67,618,101	61,788,237

increase in gross revenues. These greater outlays reduced net earnings to less than the figure for the previous year although it remained above the 1924-25 net. Income figures for the years following the earthquake are shown in Table 1.

The earthquake fire burned down altogether 18 sta-

either burned or irreparably wrecked. Operations were suspended over 420 miles of line while September receipts alone dropped \$3,000,000. As the year advanced,



Station at Veno in Course of Reconstruction

however, traffic gradually revived with people from the country visiting the stricken area and with the enormous volume of building materials moving thereto. Thus, contrary to what had been apprehended, the 1923 traffic turned out favorably on the whole.

The development of these government railways during the past 20 years has been quite striking. Before 1908 when the state took over and consolidated 2,823 miles of line from seventeen private companies, the aggregate length of state lines was but 4,444 miles. The government now operates 8,919 miles of line with a total capital investment of approximately \$1,228,000,000 and 200,000 employees. During the fiscal year 1926-27, a total of 740,333,000 passengers and 73,602,000 tons of freight were carried. Other traffic statistics also appear in Table 2.

The decrease in the average journey per passenger and the average haul per ton of freight is reflected in the lessening revenue per passenger and per ton. Receipts per passenger mile, however, have shown some tendency to increase until the decline to 1 cent in 1926 as against 1.1 cents in the two preceding years. This latter is explained by the growing number of suburban passengers, the decrease in passengers using superior accommodations and the larger number of commutation tickets. The lower revenue per ton is due to the completion of new lines offering shorter routes. Receipts per ton mile however, have remained fairly constant at 1.31 cents over the four-year period.

The earthquake disaster has not materially affected the construction program laid down in 1922. This contemplates a network of 149 lines aggregating 6,349 miles in length, the completion period and cost of each line to be determined by the Diet. Some 835 miles at an



A View Showing Three Tunnels on the Usui Pass Electrified Section

mountainous districts, call for a high degree of engineering skill and ingenuity, especially on account of tunnel work. Only the entrances to tunnels in the stricken area were damaged by the quake.

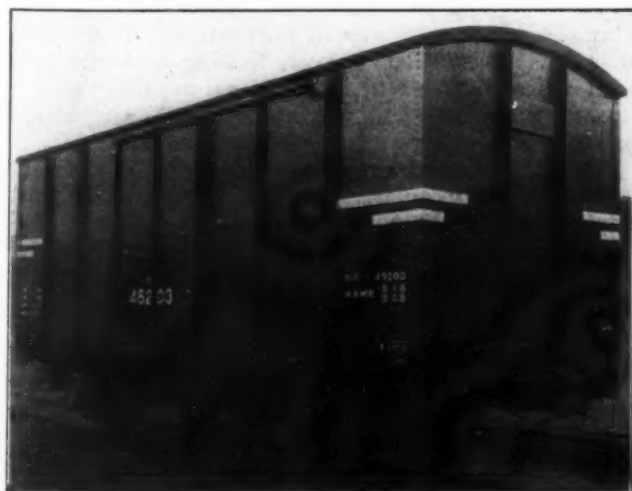
The government railways now have in the course of

Table 2

	1923	1924	1925	1926
Passengers carried (thousands)	597,288	640,828	683,568	740,333
Passenger miles (thousands)	10,693,941	11,297,862	11,694,646	11,997,034
Passengers per mile of road per day	4,140	4,201	4,200	4,189
Average journey per passenger	18.5m	17.6m	17.1m	16.2m
Receipts per passenger	17.5c	16.5c	15.5c	14.6c
Receipts per passenger mile	0.9c	1.1c	1.1c	1.0c
Tons of freight carried (thousands)	64,782	70,057	71,939	73,602
Ton miles (thousands)	6,392,328	7,047,680	7,226,686	7,265,266
Tons carried per mile of road per day	2,452	2,598	2,574	2,516
Receipts per ton	\$1.29	\$1.30	\$1.29	\$1.28
Receipts per ton mile	1.31c	1.30c	1.31c	1.31c

estimated outlay per mile of \$94,400 are now being constructed. The yearly extension is planned to be about 250 miles.

Lines let for future construction, being mostly in



All-Steel Box Car

construction 190 tunnels, aggregating 56.8 miles in length. The longest is the Shimizu tunnel 31,831 ft. long in the heart of the main island. The Tanna tunnel, intended as a short cut to the Tokaido trunk line, has proved most difficult to construct. The presence of several faults in the strata and of subterranean springs with water gushing at the rate of 24,000 gal. a minute offers the most formidable obstacle.

Steam locomotives in service on July 31, 1927, totaled 3,911, when there were also in service 9,261 passenger cars and 61,969 freight cars. Passenger locomotives are mainly of the 4-6-0 and Pacific 4-6-2 types while those for freight service are Consolidation 2-8-0 and Mikado 2-8-2. In 1914 the 2-8-0 was introduced and 670 of these are now used in passenger service.

Electrification, inaugurated in 1904, with the equipment of 7.5 miles of line, has proceeded until 60 miles in the Tokio suburban area are now operated electrically. It is also proposed to electrify 299.9 additional miles at an estimated cost of \$10,380,000. Work on a 52-mile section of this project was inaugurated in 1922 only to be interrupted by the earthquake. Restoration work is now practically complete. Electrification plans for the near future call for the equipment of 91.2 miles radiating from Tokio.

I. C. C. Accident Investigations— October, November, December

BULLETIN No. 34 of the Interstate Commerce Commission, Bureau of Safety, giving a summary of accident investigation reports for the last quarter of 1927 contains condensed reports on ten collisions and 15 derailments. Of the 11 accidents occurring in October, abstracts were printed in the *Railway Age* of May 5, and the seven in November were abstracted in the issue of June 2. The seven accidents in December are given below.

The bulletin contains a list, filling four pages, tabulating the principal points concerning each accident investigated since January 1, 1927, with a brief paragraph giving the cause.

Following is a list of all the cases reported in this bulletin, the numbers at the left being those of the government record:

1365. Tex. & New Orleans (So. Pac.)	Mexia, Tex.	Oct. 2	D
1366. Chic., Mil. & St. P.	Murdo MacKenzie, S. D.	Oct. 2	D
1367. N. Y., N. H. & H.	Providence, R. I.	Oct. 8	C
1368. N. Y., N. H. & H.	Hillside, Mass.	Oct. 13	D
1369. New York Central	Kanauga, Ohio	Oct. 15	C
1370. Atchison, T. & St. F.	Augusta, Kan.	Oct. 17	C
1371. A. T. & St. F.	Tejon, N. M.	Oct. 18	C
1372. Denver & Rio G. W.	Funston, Colo.	Oct. 19	C
1373. Delaware, L. & W.	Hallstead, Pa.	Oct. 19	D
1374. Texas & Pacific	Waskom, Tex.	Oct. 20	D
1375. Baltimore & Ohio	Hampton, W. Va.	Oct. 23	C
1376. Texas & Pacific	Donaldsonville, La.	Nov. 6	C
1377. Southern	Loudon, Tenn.	Nov. 10	D
1378. Atlantic Coast Line	Chatmar, Fla.	Nov. 11	D
1379. Great Northern	Red Eagle, Mont.	Nov. 12	D
1380. Pennsylvania	Indianapolis, Ind.	Nov. 17	D
1381. Central of Georgia	Covington, Ga.	Nov. 24	C
1382. Dayton Union	Dayton, Ohio	Nov. 29	D
1383. Missouri Pacific	Reily Lake, Ill.	Dec. 10	D
1384. Baltimore & Ohio	Guffey, Pa.	Dec. 11	D
1385. Southern	Lumber City, Ga.	Dec. 13	D
1386. St. Louis-San Fran.	Portia, Ark.	Dec. 14	C
1387. Pennsylvania	Warren, Pa.	Dec. 20	D
1388. Chicago, B. & Q.	Whitetail Summit, S. D.	Dec. 30	D
1389. Chicago & Alton	Chicago, Ill.	Dec. 31	C

December Accidents

Missouri Pacific, Reily Lake, Ill., December 10, 3:50 a.m.—Northbound freight train, extra 1320, ran over a misplaced switch and collided with a southbound freight standing on the side track; fireman of northbound train killed and one other employee injured. The switch had become loose because of a broken head rod, leaving the switch light to indicate green (all-clear). The defective head rod was examined by J. E. Howard, engineer physicist for the government, who found that it was made of mild steel, of good quality, but that it was defective when it was put in, nine years ago, being bent, so that in service it was exposed to a succession of bending stresses.

Also, the clip by which it was bolted to the switch rail, was not well fitted, so that the metal of the head rod was abraded at diagonal corners; and the bending stresses were concentrated across the bolt hole. The fracture, when discovered, after the collision, was found to be bright colored for only one-fourth of its area.

Baltimore & Ohio, Guffey, Pa., December 11, 10:03 p.m.—Westbound passenger train No. 19, running at 35 or 40 miles an hour, was derailed at a point where the track had been maliciously weakened, and the locomotive was overturned. The baggageman was killed and 12 passengers and three employees were injured. It was found that the bolts had been removed from several joints in the track and also many spikes loosened; and the work appeared to have been done by some person experienced in track work; but the guilty person (at the time the report was made) had not been found.

Southern, Lumber City, Ga., December 13.—Southbound freight train No. 55, moving at about 55 miles an hour, was derailed by a broken rail and many cars were badly damaged. The fireman, who either jumped or was thrown from the engine, was killed and one other employee was injured. The failure of the rail was due to the presence of a transverse fissure.

Entire Crew Responsible

St. Louis-San Francisco, Portia, Ark., December 14, 5:35 a.m.—Southbound passenger train No. 105, consisting of a locomotive and ten cars, moving at a speed estimated to have been between 35 and 60 miles an hour, ran past the station at Portia, where it should have waited until 5:49, and collided with northbound freight No. 136, which was running at 25 miles an hour or faster, making a very bad wreck, part of which was destroyed by fire; it caused the death of the engineman of the passenger train; 56 passengers, five mail clerks and six employees were injured. The line of road is straight, but there was a dense fog so that neither engineman had more than a short view of the headlight of the opposing train.

The dispatcher's order requiring the passenger train to wait at Portia until 5:49, had been delivered to the train at Thayer, 52 miles north of Portia; and it had been read, not only by the engineman, but by the conductor, the train porter, the rear brakeman and the fireman. It appears from the testimony of the fireman that the engineman had fixed in his mind the time limit at Portia at 5:29 instead of 5:49, but how he came to make this mistake is not known. The fireman had such confidence in the engineman that he took no pains to check him. The fireman knew that the engineman neglected to sound a meeting-point whistle, as was required by the rule, but made no remonstrance. The roadmaster was riding on the locomotive and saw the orders, but did not take care to memorize the times. The roadmaster was on the engine because of numerous places along the line where speed had to be slackened because of flood water, but these points had all been passed before Portia was reached. The conductor of No. 105 thought he understood the road * * * but for some reason "was under the impression that the first wait was at Hoxie," six miles beyond Portia. The train porter soon forgot the orders because he had had no sleep for 24 hours.

Being an extra porter and not having steady work, he had been working in an industrial plant during the day prior to the collision. A road foreman of equipment was riding in this train as an inspector, endeavoring to improve the performance of the train, and he had read the orders received at Thayer, looking over the conductor's shoulder; but he did not keep in mind the contents of the orders and was not very well acquainted with the road.

Tests of train-order efficiency are made by assistant superintendents regularly, and there must be at least 20 such tests each month on each sub-division. Assistant superintendents, when boarding a train, are required to ask the fireman and the brakeman what orders are held by the train.

The report says nothing about the kind or brilliancy of the locomotive headlights. No mention is made of more than one brakeman (the flagman) or of any baggageman, on train 105. The blame is placed on "the entire crew" of this train.

Train 105 is considered to be one of the most important on the division and extra efforts have been made to keep it on time.

Pennsylvania, Warren, Pa., December 20.—East-

bound passenger train No. 8970, moving at about 35 or 40 miles an hour, was derailed at a highway crossing, and after running a short distance to a switch, the locomotive was overturned and wrecked. The engineer and fireman were killed, one passenger and one express messenger injured. A coupler-yoke rivet which had become lodged in the flangeway at the crossing is believed to have derailed the leading truck of the locomotive. The rivet is supposed to have dropped from a car in a freight train.

Chicago, Burlington & Quincy, White Tail Summit, S. D., December 30, 7:15 p.m.—A freight train consisting of a locomotive, five freight cars and one coach, moving at about 25 miles an hour, was derailed at a curve and the locomotive and first three cars fell down a bank and were wrecked. The engineer and fireman were killed. The derailment was due to the failure of the engineer to control the train on a steep grade. It was moving down hill at about 160 ft. to the mile on a curve of *thirty-six* degrees and the temperature at the time was 20 deg. below zero. The track is narrow gage and the rails, 65 lb., were laid in 1902. The maximum allowable speed is 15 miles an hour. The train had been stopped for some time at the summit of the hill and it appears that the brakes had not been applied soon enough to properly warm the shoes. The investigation developed that the testing of pressure-retaining valves had been much neglected on this division and the brakeman who examined the brakes, although a man of seven years' experience, was not qualified to decide whether or not the piston travel was satisfactory.

Chicago & Alton, Chicago, Ill., December 31, 9:34 a.m.—Northbound passenger train No. 78, unexpectedly stopped, was run into at the rear by northbound passenger No. 10, traveling at an estimated speed of 40 miles an hour or faster; and one passenger car and one baggage car were badly crushed; and much other damage was done. Two passengers were killed and 56 passengers and two employees were injured. This collision occurred within yard limits where all trains are required to be run under control. The leading train had been moving slowly from Argo because of severe cold weather and snow and because a high wind was blowing smoke and steam across the track so as to interfere with the engineer's view. The leading train had been stopped a short distance back and the flagman had then gone back; but he rejoined his train. He was slow in going back after the second stop and he is held responsible for the collision, jointly with the engineer of the second train. The second train also was violating a speed limit of 30 miles an hour.

* * *



The "Broadway Limited" at Englewood, Ill.

Looking Backward

Fifty Years Ago

The reorganized and reconstructed Alabama Great Southern [now a part of the Southern], the successor to the Alabama & Chattanooga, began on June 2 the operation of first-class passenger trains with automatic brakes over its entire length of 295 miles between Chattanooga, Tenn., and Meridian, Miss.—*Railway Age*, June 6, 1878.

A decision has finally been rendered in the railway war between the Atchison, Topeka & Santa Fe and the Denver & Rio Grande, for the possession of the Grand Canyon of the Arkansas river in favor of the former company. The canyon is very narrow and walled very high, so that only a single road-bed is practicable. The forces of the Rio Grande have been withdrawn from the canyon and a large force of Santa Fe workers are engaged in grading the extension to Leadville, Colo.—*Chicago Railway Review*, June 8, 1878.

On June 3 a force of workmen on the Canada Southern [now part of the Michigan Central] forcibly prevented the crossing of the Toledo & Ann Arbor [now the Ann Arbor] at Alexis, Ohio, which was not being done in accordance with previous arrangements. That night President Ashley of the Ann Arbor secured additional help and made the crossing, holding it with armed men until the next morning at 4 o'clock when he obtained an injunction from the Common Pleas court, restraining obstruction to operations.—*Railway Age*, June 6, 1878.

Twenty-Five Years Ago

H. E. Byram has been appointed assistant to the first vice-president of the Chicago, Rock Island & Pacific, with office at Chicago.—*Railway Age*, June 12, 1903.

The attorney-general of Texas has approved the charter of the St. Louis, Brownsville & Mexico [now part of the Gulf Coast Lines], which has been incorporated with a capital stock of \$1,000,000 to build a railroad from Sinton, Tex., southwest to Brownsville with a branch running northwest of Brownsville along the Rio Grande river, a total of 200 miles.—*Railway Age*, June 12, 1903.

Chauncey M. Depew in an interview on the industrial situation, given at Chicago on June 4, stated that "strikes are the signboards of prosperity. You never hear of strikes in hard times. A strike is an effort to adjust the proper share of labor. One good result of a strike is that it forces both sides of the controversy to organize. It follows that there are fewer elements in the struggle and that increases the chances of a permanent agreement."—*Railway and Engineering Review*, June 6, 1903.

Ten Years Ago

The first appointment of a federal manager to take charge of a railroad under government control became effective on May 21 with the announcement by Director-General McAdoo that Joseph H. Young, president of the Norfolk Southern, had been named federal manager of the Virginian.—*Railway Age*, June 7, 1918.

In Atlanta, Ga., on May 24, the state railroad commissioners of Georgia, Alabama, North and South Carolina, Tennessee and other southern states, held a conference on the matter of the status of the short line railroads, and will follow the lead of the Texas commissioners in making representations to Director-General McAdoo in behalf of the taking over of all the short lines.—*Railway Age*, June 7, 1918.

The four principal express companies operating in the United States, the Adams Express Company, the American Express Company, Wells Fargo & Company and the Southern Express Company are to be combined into a new company, effective July 1, to be known probably as the American Railroad Express Company, which will be given virtually a monopoly of the express business on railroads under federal control, through a contract with the Railroad Administration.—*Railway Age*, June 7, 1918.

Communications and Books

Funding Pension Plans

NEW YORK.

TO THE EDITOR:

The series of editorials concerning railway pension plans that are appearing in the *Railway Age* are extremely interesting and timely. Under the title "Pension Allowances," in the issue of May 19, 1928, page 1139, you raise the question of funding pension plans. In the *Railway Age* of April 17, 1926, you published an article of mine in which I advocated the funding of pension plans and pointed out that by taking advantage of interest accumulation on a pension fund the charge to operating expense could be greatly reduced. In a letter to the Editor signed "Vice-President," published in the *Railway Age* of June 5, 1926, it is pointed out that while the plan of funding proposed in my article would decrease the charge to operating expense, it would likewise decrease the credit represented by interest from funded or unfunded securities held in the treasury and that there would be no net saving to the railroads. "Vice-President" also stated his opinion that the controlling argument for funding was sentimental rather than financial.

In my reply to "Vice-President," published in the same issue, I expressed my belief that the pension fund should be built up through charges to operating expense and not through appropriations from surplus, but admitted that revenue used to build up a pension fund through charges to operating expense might be made to earn more and be used to better advantage if carried through to net income. I also stated my belief that the controlling argument for funding was ethical rather than financial or sentimental.

The article and letter referred to above were written some two years ago and in the meantime I have had occasion to study several railroad pension plans. Some of the evidence accumulated in these studies has a direct bearing on the question of funding pension plans and may help to a solution of the problem.

In one railroad pension plan studied the total payments to pensioners in 1911 was \$208,195 and the matured liability unliquidated at the end of 1911 was \$1,710,573, or more than eight times the payments to pensioners during the year. In 1918 the total payments to pensioners was \$418,352 and the matured liability unliquidated at the end of the year was \$3,474,719, or more than eight times the payments to pensioners. In 1925 the total payments to pensioners was \$900,689 and the matured liability unliquidated at the end of the year was \$7,384,707, still more than eight times the payments during the year. "Matured liability unliquidated" represents the amount at any given time, that will be paid to pensioners on the pension roll during the remainder of their lifetime.

In spite of the fact that the payments to pensioners more than doubled from 1911 to 1918, and doubled again by 1925, the matured liability unliquidated increased faster still and was more than eight times the payments at the end of every year. The amount charged to operating expense during all these years was the amount paid to pensioners. The proof is positive that the current charge to operating expense was inadequate to meet the liability on account of employees currently retired, with the result that matured liability was and still is constantly being piled up that will have to be liquidated some time in the future. The question is—How? It seems probable that if current pension liability is not charged to operating expense currently it may never be charged to operating expense but may have to be met eventually from surplus. In that event the larger part of the burden of financing railroad pension plans would be shifted to stockholders in spite of the fact that the I. C. C. has for more than twenty years recognized pension cost as a proper charge to operating expense to be borne by the rate payer.

My conclusion is that it behooves the railroads to determine the real cost of their pension plans and present their case to the I. C. C. at the earliest possible moment with the object of securing a revision of the accounting classification that will enable them to make the proper charge to operating expense. When, and if, the current cost of a pension plan is charged currently to operating expense a pension fund is the result because the net cost is greater than the amount paid to pensioners for a period of 50 to 60 years after the number of employees has ceased to grow.

J. C. CLARK.

Books and Articles of Special Interest to Railroaders

(Compiled by Elizabeth Cullen, Reference Librarian,
Bureau of Railway Economics, Washington, D. C.)

Books and Pamphlets

Aeronautics Trade Directory, compiled by Aeronautics Branch, Department of Commerce. Comprises two sections one on commodities such as airplanes, clothing, engines, hangars, spare parts, etc., and the other on activities such as airways operation, air services, instruction courses, aeronautical insurance, servicing and repair. 29 p. Pub. by U. S. Govt. Print. Off., Washington, D. C.

Railway and Industrial Compendium, Railway Number, Vol. I, No. 1, May 25, 1928. "Formerly a Supplement or Section of the Commercial & Financial Chronicle." Review of developments under Transportation Act, 1920, p. 3-8. "Increases and decreases in railroad rates [1920-1927]" p. 8-9. "Changes in railroad wages [1920-1928]" p. 9-12. "Railroad companies, U. S., Cuba, Canada, Mexico and other foreign countries" p. 15-150. Maps of larger systems included. 152 p. Pub. by Wm. B. Dana Company, New York City. \$2.

Periodical Articles

Historical Notes on Locomotive Design, 1769-1840, by E. G. Young. Important improvements from Nicholas Cugnot to the "Governor Paine." Illustrated. Bulletin No. 16 of the Railway and Locomotive Historical Society, May, 1928, p. 9-22.

Laying Down the Law for Railroad Mergers. Summary of editorial opinion on recent Interstate Commerce Commission decisions. Literary Digest, June 2, 1928, p. 8-9.

The Purchasing Power of Railroads, by James E. Taussig. The president of the Wabash goes into some intriguing details, as for instance on p. 22, "It is plain that of every hundred eggs laid on the farm railroad men eat eight; of every hundred bushels of wheat consumed in the country railroad men as customers pay the ultimate cost of eight bushels; of every hundred slices of ham that go into the frying pan railroad men are the market for eight slices." Executives' Magazine, May, 1928, 2d Issue, p. 9-10, 22, 24.

Southern Railway Electrification, by E. C. Cox. The Chief Operating Superintendent of the Southern Railway of England discusses thirty years extension and progress. Journal of the Institute of Transport, May, 1928, p. 328-340 with discussion, p. 340-342.

Traveling With Children, by Dr. Edith M. Lincoln. Special facilities on railroad trains and steamships for keeping children comfortable and from being bored, with a note of the rates of fare. New York Herald Tribune Magazine, June 3, 1928, p. 19, 24.

2000-Horsepower Ljunström Turbine Locomotive. New locomotive for the London, Midland & Scottish Railway illustrated and described. Scientific American, June, 1928, p. 540.

The Iron Horse Snorts Defiance, by Hubert Malkus. A popular article on all sorts of improvements in steam locomotives. Illustrated. Popular Mechanics, June, 1928, p. 946-953.

Odds and Ends of Railroading

Frank A. Wadleigh has been appointed assistant general agent of a life insurance company at Denver. All of which goes to prove that railroading keeps a man young, for Mr. Wadleigh is 72 years old and recently retired as passenger traffic manager of the Denver & Rio Grande Western.

While railway employees engage in a great variety of sports, few of them indulge in polo as a recreation. One of these few is Paul U. Sawyer, assistant engineer, Southern Pacific, Tucson, Ariz., who has the reputation of being the best back in western polo. Paul played with the University of Arizona team in 1924, when it was runner-up in the national collegiate championship. This year he is a regular on the Sonora team, which has won the southwestern open championship for 1928.

Friendly Enemies

In common with most other roads, the St. Louis-San Francisco has a number of World War veterans in its service in various capacities, but is probably unique in having veterans of both the French and German armies working at the same shop. Edouard Andalafte, boilermaker at Springfield, Mo., served throughout the War in the French infantry, was wounded and twice decorated, having received the "Medal Militaire" and the "Croix de Guerre." Employed at the same shop, as machinist and draftsman, is Walter Schindler, who was an artillery observer attached to Von Hindenburg's army during the War.

The Highest Railway Officer in the World

William Pickwood, the highest railway officer in the world, arrived in Los Angeles recently. Mr. Pickwood is manager of the Antofagasta & Bolivia, which has 3,000 miles of line and attains a height of 16,000 ft. at Condor, Bolivia. Mr. Pickwood's headquarters are at La Paz, Bolivia, where he is also president of the highest golf club in the world, it being at an altitude of 13,500 ft.

Is 13 Unlucky?

A train crew on a railway in Massachusetts is convinced that 13 is not an unlucky number. Their conviction is based upon the fact that, while hauling 13 freight cars on April 13, every car was derailed and rolled down a steep embankment, leaving the engine and the caboose on the track. Since the entire crew was either on the engine or the caboose, no one was hurt. Of course, adherents to the theory that 13 is unlucky may claim that the train was derailed because of its 13 cars, but the crew thinks otherwise.

More Railroad Furniture With

An Envious Service Record

"Referring to the account of a desk in service on the Union Pacific since 1877, claimed to be the oldest in railway service, appearing in your issue of May 19," writes President L. F. Loree, of the Delaware & Hudson, "it may be of interest to know that the Delaware & Hudson Company has in service in its New York office a number of office chairs which have been used continuously since January 11, 1876, and, from their present good condition, will continue in use for many years to come."

The New Peril

The following report of a signal failure on the Los Angeles division of the Southern Pacific is believed to be the first of its kind:

"On reaching block signal 3971 near Ventura Junction, found same at stop and on flagging through found cause was an air-

plane which, in landing, had struck and broken the signal wires a quarter of a mile east."

The Short Line limited was delayed 20 minutes as a result of the unusual occurrence, but the airplane managed to make a landing without damage.

A "Corpse" Comes to Life

A man staggered and fell in the path of the "Pan-American" of the Louisville & Nashville at Memphis, Tenn., recently. The limited thundered over his body, with the engineer jamming on brakes furiously. When trainmen returned to pick up the "corpse" it leaped from the right-of-way and fled, unsteadily. Overtaken, the "victim" was arrested for drunkenness. He had remained prone during the seconds the train passed and, aside from being "stiff," a condition he attributed to fear, was uninjured. He is Lee Holcomb, of Beaverton, Ala.

A Polar Railway

One of the oddest railways in the world is in Russia. It was built during the World War to open up a port on the Arctic ocean. Its northern terminus is at Murmansk, the latitude being 68 deg. 59 min. north, or 147 miles north of the Arctic circle. From Murmansk it extends south to Petrozavodsk, 652 miles. It claims to be the only railway in the world operating dining car service north of the Arctic circle. Refrigeration should not be one of the problems in operating dining cars on this railway.

An Old Bell

A locomotive bell of more than usual interest is to be found in a shrine atop Mount Rubidoux, near Riverside, Cal. This bell was cast in 1868 for the "Confucius," the pioneer locomotive on the Central Pacific. The bell and the locomotive served for more than 30 years. When the locomotive was scrapped in 1900, the bell was presented to the city of Riverside and installed in the shrine on the mountain-top. For 17 years it has been tolled every morning at seven o'clock by a resident of Riverside, who makes a pilgrimage to the shrine daily.

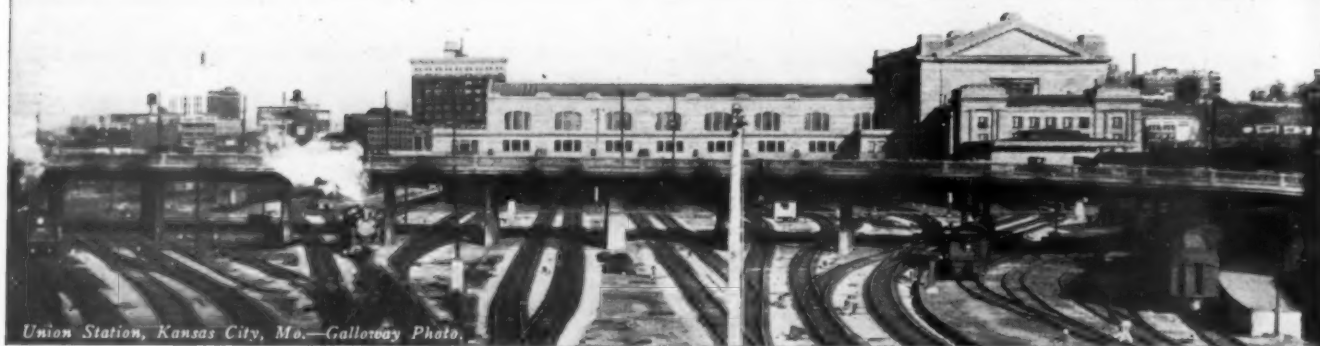
Startling Relic of a Fortunate Failure

From Lille, France, comes the report that the tens of thousands of passengers who have traveled by rail between Lille and Paris during the past ten years have been riding, without knowing it, over a powder mine. Workmen repairing the grade crossing at Libercourt unearthed a formidable collection of German shells varying in caliber from 3 to 10 inches, connected with electric detonators, skillfully buried under the track. This mine had apparently been laid by the Germans during the retreat in 1918, but the wires leading to the detonators must have been cut, preventing the explosion.

Home Again

Back to the scene of their original labors, where they were almost the first "puffing billies" used in Canada, two old locomotives, the "Samson" and the "Albion," have reached Montreal over the Canadian National, enroute to Nova Scotia. The locomotives were the property of the Baltimore & Ohio. The railway on which they operated, between the Albion mines near Stellarton and the loading ground on East River, Pictou Harbor, was opened in 1839. The company imported the locomotives from England and used them in hauling coal, these being the last engines used on this railway. The company finally disposed of its mines and all of its properties, tore up the tracks and sold the rolling stock. When the Baltimore & Ohio Centennial Exhibition was over, that company gave them to Nova Scotia, and the formal presentation of the engines to the province will take place on June 21.

NEWS of the WEEK



Union Station, Kansas City, Mo.—Galloway Photo.

THE SUPREME COURT of the United States has reassigned the argument in the St. Louis & O'Fallon valuation case, which had been assigned for October 1, to January 2, 1929.

THE READING COMPANY announces that automatic train control has been put in operation on its Bethlehem branch from Jenkintown, Pa., northward to Bethlehem, 45 miles, double track. The system is the Union two-speed continuous control with four-aspect cab signals.

THE DENVER & RIO GRANDE WESTERN, through mediation proceedings, has granted wage increases varying from \$4 to \$15 per month to 300 maintenance of way foremen. Minor increases in wages were granted to about 200 other maintenance of way employees in supervisory positions. The agreement, which became effective on May 1, expires on May 1, 1929.

THE PIEDMONT & NORTHERN (electric) Railway has filed suit in the Federal Court in the western district of South Carolina, asking the annulment of the recent order of the Interstate Commerce Commission refusing authority for the construction of an extension of the road. The company avers that its plans were begun before the effective date of the law giving the commission authority, such as has been exercised in this case, over the construction of new lines.

Pullman Porters Threaten Strike

The Brotherhood of Sleeping-car porters early this week notified the United States Board of Mediation at Washington that it contemplates a strike unless the Pullman Company agrees to open wage negotiations before noon of June 8. The porters ask for a minimum wage of \$150 for a 240-hour month. E. F. Carry, president of the Pullman Company has issued the following statement: "The Pullman Company is prepared to maintain its service to the public, is not losing any sleep over the situation, and does not anticipate that any of its patrons will be inconvenienced. The Pullman Company is fully conversant with the activities of certain outside agitators to cause defection

in the ranks of its porters, a large majority of whom are not in sympathy with the movement and will remain on the job and perform their regular duties. If vacancies occur they will be filled immediately by competent, trained men." At Washington on Wednesday evening, June 6, the Board of Mediation was making efforts to avert the threatened strike, but up to that time had not asked the President to appoint an emergency board of arbitration.

Earnings in April

Class I railroads in April had a total net railway operating income of \$70,546,551, which, for that month, was at the annual rate of return of 4.07 per cent on their property investment, according to reports compiled by the Bureau of Railway Economics. In April, 1927, the net was \$73,502,575, or 4.33 per cent. Operating revenues for the month, as shown in Table 1, below, decreased 4.9 per cent; and expenses decreased 5.6 per cent. Taxes paid in April totaled one-tenth of one per cent below 1927, and for the first four months were 1.2 per cent below 1927.

Table 1.—Earnings in April

	1928	1927
Total op. revenues..	\$474,310,406	\$498,926,448
Total op. exp.....	363,381,002	384,962,232
Taxes	30,674,547	30,700,610
Net ry. op. income	70,546,551	73,502,575
Opertg. ratio—per ct.	76.61	77.16
Return on property investment, per ct.	4.07	4.33
Four months ended April 30		
Total op. revenues..	\$1,893,513,565	\$1,987,687,365
Total op. exp.....	1,448,560,061	1,530,542,176
Taxes	119,561,257	121,033,630
Net ry. op. income	287,892,846	299,029,524
Opertg. ratio—per ct.	76.50	77.00
Return on property investment, per ct.	4.32	4.60

Thirty two class I railroads operated at a loss in April, of which 13 were in the Eastern district, 2 in the Southern and 17 in the Western.

Net railway operating income by districts for the first four months with the percentage of return based on property investment on an annual basis is shown below, with certain comparisons with the first four months of 1927.

		Per	Prev.
	ct.	Yr.	
New Eng. Region.....	\$11,486,302	5.36	...
Great Lakes.....	51,773,084	4.86	...

Central Eastn.....	60,312,674	4.62	...
Pocahontas	19,630,453	6.32	...
Total East. Dist.....	143,202,513	4.95	5.66
Total Southn. Dist.....	44,142,789	4.14	4.66
N.W. Region	22,923,770	2.87	...
Centralw. Region	51,048,000	4.03	...
S.W. Region	26,575,774	4.20	...
Total Westn. Dist.....	100,547,544	3.73	3.43
United States.....	287,892,846	4.32	4.60

Train Derailed by Tornado

At Mystic, Que., near Stanbridge, on Saturday morning, June 2, passenger train No. 268 of the Canadian Pacific, consisting of a locomotive and two cars, was struck by a tornado, and the two cars were overturned by the wind and fell down a bank. The engine remained on the rails. One passenger was killed and three trainmen and a number of passengers were injured.

Briefs Filed in New Haven Commutation Case

Briefs of counsel in the rehearing on the increase in commutation rates allowed the New York, New Haven & Hartford in 1925 have been filed with the New York Public Service Commission. A joint brief was prepared by representatives of New York City and J. Henry Esser, corporation counsel of Mount Vernon. The New Haven brief had already been submitted by company counsel.

P. J. Farrell Not Confirmed by Senate

The Senate adjourned on May 29 without acting on the nomination of P. J. Farrell, chief counsel of the Interstate Commerce Commission, who was nominated by the President for appointment as a member of the commission to succeed J. J. Esch. Mr. Farrell appeared before the Senate committee on interstate commerce on May 28 and was questioned briefly by members of the committee, after which the committee voted unanimously in favor of his confirmation. An effort was made to obtain confirmation in executive session on the final day of the session, but, as an objection was made, under the rules, the question went over to another day, which would be next December. The President was expected to give him a recess appointment.

Three New Chiefs Among "Big Four" Within Year

The defeat of William G. Lee for re-election to the presidency of the Brotherhood of Railway Trainmen marks the passing of a third "Big Four" chief within the past year. William B. Prenter was defeated for re-election by Alvany Johnston in last year's contest for the presidency of the Brotherhood of Locomotive Engineers while, during recent sessions of the Jacksonville convention of the Order of Railway Conductors, President L. E. Sheppard announced his desire to retire from office. Mr. Lee was defeated for the presidency on June 4 at the Cleveland convention of the trainmen but was later elected secretary-treasurer to succeed A. F. Whitney, the successful presidential candidate. W. N. Doak was named legislative representative and editor of *The Railroad Trainman*.

Western Railroads Will Abide by Wage Award to Firemen

Representatives of the western railways, at a meeting in Chicago on May 31, decided to abide by the ruling of the United States Circuit Court of Appeals which on May 24 upheld the decision of an arbitration board granting a wage increase of from 30 to 35 cents per hour to firemen, hostlers and hostler helpers. In this decision the railroads were acting in accordance with Section 9 of the Railway Labor Act which provides that the determination of the circuit court of appeals shall be final.

The wage award, which shall be retroactive to August 1, 1927, will involve an annual increase in the combined payroll of the 55 western railroads of about \$3,600,000. The award will become effective after the court of appeals has filed a writ of mandate in the United States District Court on June 13.

B. & M. Dedicates New Boston Yards

Eighteen hundred guests of President George Hannauer of the Boston & Maine, including traffic representatives, railroad officers and public officials of New England, attended the formal dedication of the Boston & Maine's new \$4,000,000 inbound and outbound classification yards at Somerville, Boston, Mass., on June 5.

At 12:30 p.m. the entire party was carried to the new yards in two special trains, and the first feature of the program was a table luncheon served in pavilion tents on the top of Asylum Hill, from which the entire terminal area can be seen. In a short speaking program following the luncheon, which was presided over by N. W. Hawkes, vice-president of the Boston & Maine, an exchange of greetings was made between the Commonwealth of Massachusetts, the shippers and the railroad through the remarks of John C. Hull, speaker of the House of Representatives of Massachusetts, W. F. Garcelon, chairman, New England Shippers Advisory Board, and President Hannauer.

After the luncheon the party was conducted to the throat of the new inbound classification yard where a large grand-

stand had been erected for the occasion. The formal dedication of the yards was pronounced by President Hannauer over loud speakers, while the first of six decorated cars, named after the six New England states, passed over the hump and broke through a ribbon gate at the end of the first car retarder. The remainder of the program consisted of a practical demonstration of the retarders, the switch operating mechanisms, loud speakers, and teletype machines.

Protective Section at St. Louis

The Protective Section of the American Railway Association will hold its eighth annual meeting at Statler Hotel, St. Louis, Mo., on Tuesday, Wednesday and Thursday, June 19, 20 and 21. President T. E. Pratt (C. B. & Q.) will call the first session to order on Tuesday morning at 10 o'clock. Other speakers on Tuesday morning are: L. W. Baldwin, (president, Mo. Pac.); R. J. Edgeworth (Chicago River & Indiana) and Wm. Briggs (Penn.).

Other speakers on the program are:

Tuesday Afternoon, R. S. Mitchell, (Mo. Pac.); A. L. Green, (Freight Claim Division, A. R. A.); F. F. Phillips, (A. T. & S. F.); T. T. Keliher, (Ill. Cent.); W. W. Morrison, (A. C. L.).

Wednesday Morning, C. W. Galloway, (vice president, Balt. & Ohio); R. S. Mitchell, (Mo. Pac.); J. H. Butler, (general manager American Railway Express Company); H. T. Lively, (Louisv. & Nash.).

Wednesday Afternoon, T. T. Keliher, (Ill. Cent.); G. B. Miller; A. H. Cadieux, (Can. Pac.); M. H. Bonner, (So. Pac.).

Thursday Morning, J. W. Connelly, (Southern); O. P. Powell, (assistant general manager, Pullman Company); W. C. Maxwell, (vice president in charge of traffic, Wabash.).

Outing of New York Railroad Club

The New York Railroad Club will hold its annual outing July 12. It will take the form of an excursion up the Hudson on a specially chartered steamer of the Hudson River Day Line. The destination will be the privately owned and operated park at Indian Point just below Peekskill on the Westchester shore of the Hudson. Luncheon will be served en route and, after arriving at the park, there will be a parade headed by a special band; and besides a baseball game, tennis and swimming, there will be a series of athletic contests for prizes; a three-legged race, sack races, a push-ball game, greased pole and a greased pig, besides quoits and a short golf tournament. Prizes for the different events will be provided. The committee in charge of arrangements for the excursion includes: Edward Barrett Smith of the American Brake Shoe & Foundry Co., general chairman; George F. Mand of the American Car & Foundry Co., in charge of publicity; George Le Bontillier, vice-president, Pennsylvania; George T. Cooke, president, American

Railway Products Company; R. B. White, president, Central of N. J.; H. M. Norris, I. R. T. Company; W. E. Thompson, Third Avenue Railway; W. F. Jones, New York Central Lines; A. E. Calkins, New York Central; George E. Ord, the Ellicon Company; A. H. Sisson of the Sisson Company; J. S. Doyle, Interborough Rapid Transit Company; Wm. L. Campbell, Timken Roller Bearing Company; C. R. Ellicott, Westinghouse Air Brake Company; George W. Rink; F. S. Harper, the Ellicon Company; John F. Leonard, Pittsburgh Plate Glass Company; and W. A. Cotton, of the Erie.

Attacks Canadian Railway Board

An attack on the Board of Railway Commissioners of Canada was made in the Canadian House of Commons last week by Thomas L. Church, one of the Toronto conservative members. It was occasioned by consideration of an item of \$287,100 in the estimates for the board. The item was not passed and further debate on this subject will come next week.

Mr. Church said:

The item we are now discussing passed last session at four o'clock in the morning. At that time the minister promised to bring down certain information asked for in a motion for papers. That information has not been brought down. This commission was appointed a few years ago to facilitate the settlement of disputes between the municipalities and the railways, but so far as the exercise of any jurisdiction on the part of the commission goes, this item providing for \$287,000 might as well be struck out. Indeed, I am going to move now that the item be reduced by \$200,000. This commission has ceased to exercise its functions; it has ceased to invoke the powers, privileges and functions for which it was appointed. It might just as well be abolished, and we might profitably go back to the law of supply and demand for all the commission has done in the way of regulating freight and passenger charges and express and telephone rates.

The people of this country are entitled to better treatment than they have been receiving at the hands of the commission. The Board of Railway Commissioners is not a court; it never was a court, some of the gentlemen on the commission are not lawyers and are not qualified to be judges. You might as well suggest that the Civil Service Commission was a court. A ruling was given recently to the effect that there could be no criticism of the commission because it is a court. When the bill was introduced into this house, under the Laurier government, setting up the commission the reasons given for the creation of the commission were that, in the first place, the railway committee of the privy council, which was a committee of the cabinet, was too busy and that, secondly, in a matter of this sort we should have railway and civil engineers on the board the commission was to be in effect a committee of Parliament. This commission was created under the auspices of a great chairman, the late Mr. Justice Mabee, and later under Sir Henry Drayton. Under the chairmanship of these gentlemen the commission got somewhere, but now it has fallen from grace. One application with regard to express rates, has been before the commission for eight or ten years or longer than that, with the result that the commissioners who originally had the question under consideration have all died. No decision has ever been given in the matter. The members of the board are dead and gone, and no proper hearing has been held to determine the case. Now the express rates case must be heard all over again, and the municipalities have been invited to come back to Ottawa and see what can be done.

Anti-Trust Proceedings Against B. & O.

The Interstate Commerce Commission has added to its list of proceedings against railroads that have acquired stock interests in other carriers without first having obtained authorization from the Commission to acquire control, by issuing a complaint against the Baltimore & Ohio charging it, "on information and

(Continued on page 1356)

Revenues and Expenses of Railways

MONTH OF APRIL AND FOUR MONTHS OF CALENDAR YEAR 1928—CONTINUED

Name of road	Av. mileage operated during period	Operating revenues			Operating expenses			Operating ratio	Net from railway operation	Operating income (or loss)	Net ry. operating income, 1927
		Freight	Passenger, (inc. misc.)	Total	Maintenance of way and structures	Equip- ment	Traffic	Trans- portation			
Chicago Great Western.....	1,495	\$1,494,264	\$227,197	\$1,721,461	\$288,540	\$354,247	\$80,143	\$784,128	\$1,721,461	\$214,547	\$70,986
Chicago, Indianapolis & Louisville.....	1,495	6,033,473	962,934	6,996,407	817,684	1,485,848	323,440	2,237,539	6,996,407	1,085,954	472,621
Chicago, St. Paul & Pacific.....	1,495	1,165,006	187,866	1,352,872	155,779	302,237	41,146	552,105	1,352,872	328,368	208,070
Chicago, St. Paul & Northern Pacific.....	1,495	4,732,211	698,966	5,431,177	511,599	1,264,541	158,508	2,290,340	5,431,177	1,245,473	737,204
Chicago, St. Paul & Northern Pacific.....	1,495	9,886,340	1,363,936	11,250,276	2,247,112	2,488,717	266,592	4,498,177	11,250,276	1,672,164	1,270,507
Chicago River & Indiana.....	1,495	4,081,043	5,627,672	9,708,715	6,060,960	10,127,230	1,020,693	19,168,568	9,708,715	10,081,289	8,409,175
Chicago, Rock Island & Pacific.....	1,495	7,561,477	1,508,891	9,070,368	1,375,503	2,117,448	233,615	3,740,817	9,070,368	1,409,661	1,088,077
Chicago, Rock Island & Pacific.....	1,495	3,147,477	6,217,229	9,364,706	8,326,606	8,326,606	943,322	15,515,710	9,364,706	7,321,844	5,750,829
Chicago, Rock Island & Pacific.....	1,495	4,117,747	62,634	4,180,381	97,784	51,778	20,509	186,697	4,180,381	148,862	89,410
Chicago, St. Paul & Northern Pacific.....	1,495	1,666,737	268,141	1,934,878	257,372	207,357	78,160	778,219	1,934,878	629,453	519,934
Chic., St. Paul, Minn. & Omaha.....	1,495	1,453,242	337,262	1,790,504	281,693	405,346	39,456	857,143	1,790,504	176,567	113,670
Clinchfield Railroad.....	1,495	6,491,030	1,359,527	7,850,557	1,088,135	1,722,377	155,685	3,816,201	7,850,557	919,163	698,550
Colorado & Southern.....	1,495	532,475	15,595	548,070	58,642	125,866	16,219	123,762	548,070	137,436	219,844
Ft. Worth & Denver City.....	1,495	2,215,697	68,714	2,284,411	244,932	508,979	90,390	507,030	2,284,411	611,649	933,346
Colorado & Southern.....	1,495	693,935	88,951	782,886	221,901	197,963	14,953	321,938	782,886	60,129	7,083
Colorado & Southern.....	1,495	3,098,481	350,711	3,449,192	702,352	803,945	57,850	1,378,255	3,449,192	632,458	367,067
Ft. Worth & Denver City.....	1,495	606,436	139,048	745,484	180,924	130,772	18,410	256,023	745,484	200,076	172,780
Wichita Valley.....	1,495	2,676,578	608,079	3,284,657	628,287	532,676	69,589	1,085,602	3,284,657	1,071,517	889,063
Wichita Valley.....	1,495	120,348	11,823	132,171	26,065	7,457	33	41,884	132,171	54,218	30,287
Columbus & Greenville.....	1,495	540,534	50,449	590,983	88,723	32,244	86	172,128	590,983	286,003	187,187
Columbus & Greenville.....	1,495	100,967	18,460	119,427	38,004	16,219	3,615	46,192	119,427	10,050	864
Conemaugh & Black Lick.....	1,495	462,167	77,586	539,753	152,010	69,835	16,251	203,620	539,753	76,570	25,471
Conemaugh & Black Lick.....	1,495	57,970	.....	57,970	11,894	29,543	912	82,449	57,970	63,128	30,287
Delaware & Hudson.....	1,495	219,777	.....	219,777	51,611	113,146	3,729	313,146	219,777	325,448	187,187
Delaware & Hudson.....	1,495	2,769,586	236,106	3,005,692	367,512	694,202	47,686	1,175,266	3,005,692	286,003	187,187
Delaware & Hudson.....	1,495	1,038,504	1,038,504	2,077,008	1,697,092	3,186,399	207,012	4,793,482	2,077,008	1,238,210	1,164,463
Delaware, Lackawanna & Western.....	1,495	5,228,881	928,492	6,157,373	723,012	1,111,971	133,802	2,647,275	6,157,373	1,512,055	1,543,086
Denver & Rio Grande Western.....	1,495	18,649,014	3,720,056	22,369,070	2,598,960	5,532,619	533,251	10,633,261	22,369,070	3,988,867	4,117,729
Denver & Rio Grande Western.....	1,495	1,906,844	247,102	2,153,946	549,325	502,936	62,490	706,240	2,153,946	412,405	300,555
Denver & Rio Grande Western.....	1,495	8,121,619	981,161	9,102,780	1,841,350	2,661,444	227,979	3,005,353	9,102,780	1,464,606	1,719,367
Denver & Salt Lake.....	1,495	250,211	21,397	271,608	45,787	64,538	1,551	45,454	271,608	119,747	112,733
Denver & Salt Lake.....	1,495	1,107,117	101,130	1,208,247	188,033	338,648	6,726	272,047	1,208,247	395,878	430,351
Detroit & Mackinac.....	1,495	1,003,326	12,527	1,015,853	32,738	24,862	1,983	42,313	1,015,853	13,298	3,353
Detroit & Mackinac.....	1,495	360,312	52,407	412,719	91,489	100,447	7,673	170,352	412,719	54,717	28,749
Detroit & Toledo Shore Line.....	1,495	378,318	.....	378,318	50,049	36,058	3,850	107,772	378,318	141,661	68,145
Detroit & Toledo Shore Line.....	1,495	1,676,218	.....	1,676,218	143,428	143,428	14,520	426,389	1,676,218	825,078	495,653
Detroit Terminal.....	1,495	.....	1,779,953	1,779,953	16,666	10,719	.....	75,324	1,779,953	52,144	54,398
Detroit Terminal.....	1,495	.....	661,601	661,601	62,953	56,266	.....	306,159	661,601	154,015	159,603
Detroit, Toledo & Ironton.....	1,495	756,987	3,435	760,422	98,176	151,227	12,379	246,945	760,422	186,910	131,009
Duluth & Iron Range.....	1,495	2,955,250	14,342	2,969,592	379,790	633,262	50,173	1,025,743	2,969,592	813,632	387,190
Duluth & Iron Range.....	1,495	63,921	3,749	67,670	66,301	106,101	1,663	83,731	67,670	212,602	209,402
Duluth, Missabe & Northern.....	1,495	307,739	20,751	328,490	230,896	411,220	6,842	361,889	328,490	788,491	785,231
Duluth, Missabe & Northern.....	1,495	67,464	4,717	72,181	134,564	166,019	3,005	127,767	72,181	443,170	442,826
Duluth, Winnipeg & Pacific.....	1,495	297,840	21,400	319,240	374,119	644,518	12,486	522,990	319,240	1,572,072	1,580,609
Duluth, Winnipeg & Pacific.....	1,495	165,848	9,107	174,955	30,618	47,264	5,062	65,833	174,955	24,236	7,688
Elgin, Joliet & Eastern.....	1,495	829,249	44,616	873,865	104,787	198,212	18,692	312,382	873,865	180,778	147,027
Erie Railroad.....	1,495	1,962,301	12	1,962,313	218,491	421,987	14,838	727,853	1,962,313	575,701	401,068
Erie Railroad.....	1,495	7,742,826	35	7,742,861	715,879	1,678,371	59,490	2,992,618	7,742,861	2,841,738	1,699,672
Erie Railroad.....	1,495	7,101,956	833,577	7,935,533	1,060,238	1,950,692	170,504	3,385,061	7,935,533	1,390,354	1,308,078
Chicago & Erie.....	1,495	27,584,472	3,276,577	30,861,049	3,808,108	7,994,851	763,154	13,875,800	30,861,049	4,416,461	4,089,847
Chicago & Erie.....	1,495	944,994	44,973	989,967	155,905	170,071	25,645	345,399	989,967	301,660	12,972
New Jersey & New York.....	1,495	4,035,668	162,826	4,198,494	598,235	649,236	99,888	1,662,498	4,198,494	1,363,017	210,050
New Jersey & New York.....	1,495	34,514	92,770	127,284	23,566	24,631	1,539	70,317	127,284	8,629	26,652
N. Y., Susquehanna & Western.....	1,495	117,096	369,042	486,138	68,534	103,453	6,501	288,853	486,138	7,934	119,993
N. Y., Susquehanna & Western.....	1,495	319,442	42,434	361,876	49,401	49,401	4,891	178,981	361,876	79,478	53,657
Evansville, Indian. & Terre Haute.....	1,495	1,200,552	173,379	1,373,931	199,056	236,190	20,114	778,693	1,373,931	143,930	23,552
Evansville, Indian. & Terre Haute.....	1,495	142,585	3,563	146,148	25,013	20,113	2,491	55,613	146,148	96,346	9,191
Florida East Coast.....	1,495	634,603	16,576	651,179	85,198	91,736	9,447	24,358	651,179	196,203	50,662
Florida East Coast.....	1,495	877,731	400,168	1,277,899	183,077	199,851	28,239	428,850	1,277,899	392,005	322,431
Florida East Coast.....	1,495	3,067,434	6,252,796	9,320,230	808,301	860,365	167,134	1,856,469	9,320,230	1,625,775	1,347,867

Revenues and Expenses of Railways

MONTH OF APRIL AND FOUR MONTHS OF CALENDAR YEAR 1928—CONTINUED

Name of road	Av. mileage operated during period.	Operating revenues			Operating expenses			Operating ratio.	Net from railway operation.	Operating income (or loss).	Net rv. operating income, 1927.
		Freight.	Passenger, (inc. misc.)	Total.	Way and structures.	Maintenance of equip-ment.	Traffic.	Trans- portation.			
Fort Smith & Western.....	249	\$9,235	\$107,450	\$116,685	\$28,585	\$82,979	\$6,163	\$41,592	\$6,753	\$105,044	\$16,761
Galveston Wharf	249	406,053	38,591	444,644	111,897	23,690	27,288	17,233	27,288	30,974	16,619
Georgia Railroad	13	.....	118,785	118,785	4,781	114,004	2,580	109,775	19,072	97,687	68,883
Georgia & Florida	13	.....	535,134	535,134	185,984	349,150	11,240	29,775	19,072	515,657	250,372
Grand Trunk Western.....	328	344,608	61,932	406,540	80,805	325,735	22,244	189,516	23,363	355,679	81,404
Atlantic & St. Lawrence.....	328	1,367,784	230,449	1,598,233	329,437	1,268,796	94,744	772,696	148,186	1,450,610	331,238
Chic., Det. & Canada Gr. Tr. Jet.	445	90,623	11,029	101,652	17,316	84,336	8,332	51,063	7,871	93,781	267,429
Detroit, Grand Haven & Mil.	445	452,729	50,962	503,691	76,001	427,690	37,300	214,447	32,716	470,975	190
Grand Trunk	345	1,587,828	155,214	1,743,042	386,704	1,356,338	46,047	637,287	60,242	1,683,000	270,639
Atlantic & St. Lawrence.....	345	593,478	628,566	1,222,044	500,435	721,609	168,831	2,475,701	269,451	1,453,253	1,052,290
Chic., Det. & Canada Gr. Tr. Jet.	166	130,489	12,218	142,707	26,365	116,342	3,328	10,091	8,166	134,536	1,087,173
Grand Trunk	166	738,317	120,240	858,557	174,875	683,682	29,939	592,740	35,117	823,817	137,457
Chic., Det. & Canada Gr. Tr. Jet.	307	291,371	326	291,697	11,551	280,146	4,853	94,510	3,653	197,187	401,592
Detroit, Grand Haven & Mil.	307	1,089,699	4,566	1,094,265	58,313	1,035,952	18,084	380,503	17,017	1,077,935	159,581
Grand Trunk	307	771,571	24,111	795,682	144,396	651,286	18,084	380,503	17,017	778,269	521,515
Chic., Det. & Canada Gr. Tr. Jet.	192	2,613,548	103,508	2,717,056	319,002	2,398,054	53,986	1,089,670	75,608	2,642,448	349,017
Grand Trunk	192	6,020,091	813,617	6,833,708	1,433,149	5,400,559	250,177	2,763,199	216,948	6,616,760	1,104,678
Green Bay & Western.....	8162	24,147,845	3,553,833	27,701,678	3,808,228	23,893,450	944,154	11,783,437	978,488	26,723,161	771,137
Gulf & Ship Island.....	234	186,166	7,135	193,301	20,014	173,287	4,103	30,205	5,314	187,972	3,888,807
Gulf, Mobile & Northern.....	234	489,476	26,168	515,644	73,713	441,931	20,294	102,671	11,065	404,866	26,759
Hocking Valley	307	221,886	39,211	261,097	60,424	200,673	5,260	102,671	8,363	252,734	114,403
Illinois Central	307	979,817	171,502	1,151,319	237,263	914,056	21,267	42,544	35,070	1,116,279	30,024
Yazoo & Mississippi Valley.....	733	588,812	30,364	619,176	121,089	498,087	30,344	187,091	27,599	591,577	134,931
Hocking Valley	733	2,253,480	124,847	2,378,327	422,283	1,956,044	121,667	763,716	117,552	2,260,571	182,409
Illinois Central	348	1,233,217	56,765	1,290,000	317,040	972,960	16,272	436,358	44,999	1,245,901	522,354
Yazoo & Mississippi Valley.....	348	4,953,784	229,060	5,182,844	1,280,576	3,902,268	68,294	1,753,018	185,706	4,996,548	288,749
Illinois Central	4915	9,373,752	1,697,460	11,071,212	1,409,279	9,661,933	231,603	4,422,217	358,327	10,703,615	814,108
Yazoo & Mississippi Valley.....	4915	39,351,643	7,602,779	46,954,422	5,343,471	41,610,951	1,066,615	18,498,833	1,430,945	45,443,396	2,222,816
Kansas City, Mexico & Orient.....	1709	1,638,827	269,193	1,908,020	390,721	1,517,299	46,340	795,393	63,447	1,844,837	8,870,399
Kansas C., Mex. & Orient of Tex.	1709	6,800,850	1,135,325	7,936,175	1,508,629	6,427,546	183,264	3,370,276	257,351	7,679,825	165,413
Kansas City Southern.....	272	272,670	16,048	288,718	29,975	258,743	3,760	147,275	10,777	277,941	779,037
Texasarkana & Ft. Smith.....	272	503,715	16,048	519,763	84,117	435,646	10,452	147,275	17,339	498,326	485,241
Kansas City Southern.....	465	1,888,463	64,198	1,952,661	605,668	1,346,993	36,907	594,660	49,733	1,903,228	2,253,973
Kansas, Oklahoma & Gulf.....	784	1,164,043	74,705	1,238,748	163,326	1,075,422	59,831	455,415	80,883	1,154,635	9,607,506
Lake Superior & Ishpeming.....	784	4,927,498	312,116	5,239,614	637,360	4,602,254	225,531	1,875,905	320,153	5,019,109	36,678
Lake Terminal	81	198,778	6,889	205,667	45,258	160,409	7,631	59,870	10,788	194,829	121,848
Lake Superior & Ishpeming.....	81	771,455	29,261	800,716	100,262	699,454	25,823	232,031	41,071	759,645	169,123
Lake Superior & Ishpeming.....	326	217,404	2,787	220,191	27,833	192,358	10,313	66,476	9,810	210,381	169,123
Lake Superior & Ishpeming.....	326	937,836	12,603	950,439	98,274	852,165	45,027	285,100	39,913	910,526	42,827
Lake Superior & Ishpeming.....	160	406,053	38,591	444,644	111,897	23,690	27,288	17,233	27,288	30,974	14,988
Lake Superior & Ishpeming.....	160	249,395	9,692	259,087	107,617	151,470	2,409	137,434	21,213	138,257	169,123
Lake Superior & Ishpeming.....	13	.....	70,397	70,397	119,508	.....	.....	45,563	1,753	38,833	169,123
Lake Superior & Ishpeming.....	13	.....	296,137	296,137	66,668	229,469	.....	191,301	7,863	288,633	169,123
Lake Superior & Ishpeming.....	13	.....	1,252	1,252	19,185	1,067	2,997	85,789	10,170	139,289	169,123
Lake Superior & Ishpeming.....	96	857,787	5,692	863,479	130,026	733,453	10,472	347,703	39,542	823,937	169,123
Lake Superior & Ishpeming.....	216	511,193	1,714	512,907	58,646	454,261	5,370	166,100	16,881	496,380	169,123
Lake Superior & Ishpeming.....	216	1,554,111	6,864	1,560,975	176,718	1,384,257	21,250	645,497	71,669	1,512,606	169,123
Lake Superior & Ishpeming.....	1364	4,893,896	584,979	5,478,875	477,179	5,001,696	135,120	2,343,541	141,246	5,360,405	222,052
Lake Superior & Ishpeming.....	1363	17,685,260	2,167,185	19,852,445	2,224,691	17,627,754	545,747	9,668,714	561,804	18,065,950	1,633,646
Louisiana & Arkansas.....	302	325,604	9,244	334,848	45,335	289,513	12,321	89,490	10,035	324,813	166,485
Louisiana Ry. & Nav. Co. of Tex.	302	1,191,755	38,265	1,230,020	177,240	1,052,780	47,681	336,903	40,506	1,190,279	103,987
Louisiana Ry. & Nav. Co. of Tex.	334	2,654,478	10,012	2,664,490	288,148	2,376,342	11,063	102,186	10,329	2,654,013	254,927
Louisiana Ry. & Nav. Co. of Tex.	334	1,023,572	37,293	1,060,865	227,745	833,120	49,233	436,793	43,479	1,016,646	34,743
Louisiana Ry. & Nav. Co. of Tex.	206	73,046	2,859	75,905	13,839	62,066	3,186	40,925	5,390	70,515	123,857
Louisiana Ry. & Nav. Co. of Tex.	206	314,598	13,390	327,988	96,849	231,139	12,301	161,222	22,222	305,716	19,382
Louisville & Nashville.....	5,077	8,639,481	1,352,261	9,991,742	1,769,072	8,222,670	195,818	3,828,150	340,976	9,650,766	83,253
Louisville, Henderson & St. Louis.....	5,077	36,301,781	5,830,609	42,132,390	6,728,517	35,403,873	1,005,709	16,158,086	1,355,364	40,777,007	1,412,704
Louisville, Henderson & St. Louis.....	199	216,078	41,120	257,198	52,672	204,526	8,806	106,180	12,288	244,910	31,350
Louisville, Henderson & St. Louis.....	199	937,248	165,879	1,103,127	210,210	892,917	34,252	438,140	47,335	1,055,782	127,684

Revenues and Expenses of Railways

MONTH OF APRIL AND FOUR MONTHS OF CALENDAR YEAR 1928—CONTINUED

Name of road	Av. mileage operated during period	Operating revenues			Operating expenses			Operating ratio	Net from railway operation	Operating income (or loss)	Net revenue, income, 1927
		Freight	Passenger	Total	Traffic	Portation	General				
Maine Central	1,122	\$1,065,245	\$264,655	\$1,329,900	\$14,816	\$601,796	\$47,564	\$1,232,691	\$248,452	\$133,298	\$110,475
Midland Valley	1,122	4,863,677	1,067,504	5,931,181	1,180,449	5,098,732	201,555	4,962,880	1,078,373	900,066	902,442
Minnesota & St. Louis	1,627	934,523	73,241	1,007,764	30,515	307,770	52,479	631,487	122,656	106,138	81,581
Minnesota, St. Paul & S. S. Marie	1,627	3,922,000	319,019	4,241,019	34,875	518,479	43,940	1,134,927	64,246	128,405	197,742
Minnesota, Duluth & Atlantic	1,627	2,526,105	346,198	2,872,303	79,367	2,186,127	173,558	4,103,181	427,782	180,027	324,880
Duluth, South Shore & Atlantic	1,627	1,271,348	154,132	1,425,480	304,943	585,510	48,270	1,147,251	2,361,747	1,524,233	1,031,323
Spokane International	165	278,343	58,789	337,132	8,048	173,309	10,431	320,422	44,901	14,833	—386
Mississippi Central	161	1,256,608	7,327	1,263,935	33,036	730,251	43,162	1,309,332	294,025	173,541	99,084
Missouri & North Arkansas	161	1,256,608	7,327	1,263,935	33,036	730,251	43,162	1,309,332	294,025	173,541	99,084
Missouri-Kansas-Texas Lines	3,188	13,230,824	2,192,436	15,423,260	1,155,480	15,066,768	1,489,859	31,902,022	9,366,711	7,576,260	5,970,229
Missouri Pacific	7,412	33,594,018	4,463,991	38,058,009	1,155,480	15,066,768	1,489,859	31,902,022	9,366,711	7,576,260	5,970,229
Gulf Coast Lines	1,026	1,108,214	135,618	1,243,832	45,658	421,617	60,202	92,813	374,372	322,223	241,913
International-Great Northern	1,017	4,508,425	577,434	5,085,859	163,996	1,677,970	232,400	3,796,477	1,374,776	1,066,297	1,010,569
San Antonio, Uvalde & Gulf	318	634,148	75,917	710,065	88,143	144,207	7,965	117,784	22,801	18,778	5,849
Texas & Pacific	2,014	3,537,797	451,941	3,989,738	9,294	3,406	32,946	517,718	28,306	17,177	—31,769
Mobile & Ohio	1,160	1,250,359	90,491	1,340,850	54,043	344,696	50,458	1,117,678	117,969	947,252	761,942
Monongahela	1,160	503,035	375,251	878,286	225,671	215,541	197,025	3,796,477	4,965,498	3,955,393	3,310,401
Monongahela Connecting	7	168,178	15,751	183,929	86,300	107,629	11,303	322,583	2,084,663	1,666,380	1,276,695
Montour	56	120,579	15	120,594	82,000	38,000	4,119	617,036	936,460	878,284	500,324
Nashville, Chattanooga & St. Louis	1,259	1,499,911	264,858	1,764,769	66,543	664,693	82,846	1,486,689	443,354	368,067	372,420
Nevada Northern	165	70,810	5,139	75,949	3,870	58,962	4,319	37,722	1,046,764	1,085,831	1,292,805
Newburgh & South Shore	6	192,921	17,592	210,513	68,368	130,655	4,951	130,655	62,266	48,250	50,483
New Orleans Great Northern	276	225,042	21,038	246,080	13,234	246,080	20,104	487,435	124,242	72,930	98,190
New Orleans Terminal	20	1,418	6,482	7,900	1,856	184,567	45,854	771,845	338,033	266,678	194,246
New York Central	6,906	18,568,155	2,507,928	21,076,083	1,764,504	43,639,640	4,569,953	92,248,012	7,021,513	4,892,210	16,543,370
Cincinnati Northern	244	328,694	1,054	329,748	6,416	117,307	17,227	245,808	94,965	69,730	55,761
Cleve., Cinn., Chicago & St. Louis	2,396	5,142,423	1,121,198	6,263,621	148,167	2,623,424	266,777	5,386,420	1,571,704	1,206,015	1,058,665
Indiana Harbor Belt	130	1,000,443	97,381	1,097,824	598,454	1,047,514	1,070,976	21,966,133	6,575,985	4,260,399	4,757,806
Michigan Central	1,858	5,256,983	1,485,982	6,742,965	19,498	1,743,411	104,672	2,820,154	354,253	283,495	224,314
Pittsburgh & Lake Erie	231	2,103,798	196,988	2,300,786	512,754	3,322,198	89,177	20,293,568	1,200,019	973,503	767,138
New York, Chicago & St. Louis	1,690	3,545,400	809,810	4,355,210	115,062	3,322,198	344,635	8,177,195	1,823,136	1,755,821	1,839,852
N. Y., New Haven & Hartford	2,157	6,039,952	3,821,672	9,861,624	532,435	6,310,192	598,527	12,697,827	1,505,841	870,714	2,461,934
	2,160	22,815,513	14,996,990	37,812,503	362,628	14,899,959	1,257,834	31,381,622	3,143,526	2,334,429	1,968,926
									11,173,767	8,663,930	5,900,940

Revenues and Expenses of Railways

MONTH OF APRIL AND FOUR MONTHS OF CALENDAR YEAR 1928—CONTINUED

Name of road	Av. mileage operated during period.	Operating revenues			Operating expenses			Operating ratio.	Net from railway operation.	Operating income (or loss).	Net ry. operating income.	Net ry. operating income, 1927.
		Freight.	Passenger.	Total.	Way and structures.	Maintenance of equip-ment.	Trans- portation.					
		(inc. misc.)	(inc. misc.)	(inc. misc.)								
Alabama Great Southern.....	April 314	\$642,920	\$130,709	\$773,629	\$142,712	\$183,541	\$241,554	74.9	\$207,915	\$144,616	\$174,619	\$165,503
Albany, New Orleans & Texas Pac.	4 mos. 314	2,465,052	3,229,263	5,694,315	548,212	663,237	1,211,449	75.6	788,688	669,532	736,304	736,304
Cinn., New Orleans & Texas Pac.	April 338	1,397,596	276,235	1,673,831	269,488	337,395	606,883	71.1	511,586	388,683	367,289	390,787
.....	4 mos. 338	5,378,823	1,170,456	6,549,279	1,083,229	1,406,067	2,489,296	71.4	1,980,309	1,581,910	1,504,168	1,410,196
Georgia Southern & Florida.....	April 397	200,732	142,731	343,463	375,358	80,434	153,560	91.1	33,440	10,674	5,743	—7,920
.....	4 mos. 400	845,602	583,676	1,429,278	1,564,503	315,031	45,486	89.6	162,078	72,937	63,971	—49,479
New Orleans & Northeastern.....	April 204	358,377	64,261	422,638	54,961	89,944	138,898	70.1	134,886	90,230	54,767	28,444
.....	4 mos. 204	1,420,460	275,392	1,695,852	240,271	333,733	51,320	68.8	566,918	388,256	264,713	285,855
Northern Alabama	April 110	82,403	6,363	88,766	91,313	12,491	34,865	60.4	36,183	30,282	18,280	27,187
.....	4 mos. 110	330,539	26,665	357,204	367,057	11,518	136,163	89.6	108,346	83,190	5,223	88,309
Southern Pacific	April 8,909	11,852,594	2,992,558	14,845,152	2,270,528	16,429,306	412,464	73.7	4,314,354	2,901,588	2,602,669	2,802,890
.....	4 mos. 8,912	46,491,664	12,343,361	58,835,025	8,647,016	11,701,890	2,715,594	73.7	17,062,412	11,623,440	11,097,718	10,085,672
So. Pacific Steamship Lines.....	April	687,865	56,748	744,613	17,944	219,156	572,235	96.7	29,117	156,561	26,462	163,660
.....	4 mos.	2,934,845	178,432	3,113,277	67,296	778,685	2,434,591	95.3	169,191	156,561	157,803	415,114
Texas & New Orleans.....	April 4,728	4,083,274	848,999	4,932,273	856,081	1,139,480	1,993,028	82.9	918,783	613,126	397,902	850,274
.....	4 mos. 4,633	16,331,451	3,548,074	19,879,525	3,626,473	4,478,884	700,414	83.5	3,549,000	2,322,834	1,350,908	850,274
Spokane, Portland & Seattle.....	April 554	538,068	77,704	615,772	123,858	102,765	21,078	69.3	206,896	123,147	118,643	163,373
.....	4 mos. 554	2,066,669	329,861	2,396,530	390,026	413,124	86,935	67.1	864,592	529,574	506,460	478,747
Tennessee Central	April 296	219,129	20,575	239,704	53,469	39,557	13,102	76.0	65,328	60,330	41,964	43,778
.....	4 mos. 296	936,257	78,652	1,014,909	204,618	167,958	50,850	78.1	237,713	213,029	137,846	75,487
Terminal Railroad Assn. of St. Louis, April 55	.....	1,042,256	178,562	1,220,818	178,562	73,356	2,315	68.1	332,730	224,643	312,558	275,075
.....	4 mos. 55	4,417,890	635,791	5,053,681	1,843,280	117,707	2,970,508	67.0	1,461,382	1,051,139	1,398,941	1,490,693
Texas Mexican	April 162	146,357	137,016	283,373	15,598	17,126	5,540	53.9	72,358	60,622	32,944	32,944
.....	4 mos. 162	376,568	16,880	393,448	53,737	63,306	15,102	69.3	128,767	108,785	85,289	27,506
Toledo, Peoria & Western.....	April 239	135,921	1,794	137,715	27,617	1,534	7,897	86.1	20,009	18,009	3,775	2,696
.....	4 mos. 239	595,845	10,849	606,694	100,365	72,881	32,098	84.6	97,407	83,345	38,047	2,162
Toledo Terminal	April 28	.....	132,663	132,663	1,929	1,929	4,749	69.9	39,907	22,407	40,920	25,306
.....	4 mos. 28	.....	465,888	465,888	36,210	62,745	19,551	66.6	155,401	85,404	197,019	227,652
Trinity & Brazos Valley.....	April 367	142,125	5,791	147,916	40,749	31,941	72,713	96.5	5,456	—2,169	—23,374	—30,842
.....	4 mos. 367	703,564	29,138	732,702	187,769	135,701	339,589	90.8	70,445	40,097	—66,244	—38,586
Ulster & Delaware.....	April 128	48,155	3,748	51,903	14,039	15,552	7,713	88.5	10,046	4,296	7,739	—1,499
.....	4 mos. 128	119,417	13,236	132,653	26,710	51,078	152,066	108.6	—22,923	—45,923	—52,651	—62,270
Union R. R. of Penna.	April 45	.....	714,600	714,600	102,316	176,581	186	91.1	63,700	44,681	123,060	10,871
.....	4 mos. 45	.....	2,779,594	2,779,594	307,373	702,903	664	91.2	235,461	179,942	496,652	423,223
Union Pacific	April 3,711	6,520,582	1,090,464	7,611,046	8,361,151	1,286,863	3,339,438	73.5	2,219,495	1,315,144	1,115,144	688,623
.....	4 mos. 3,711	26,415,404	4,276,036	30,691,440	3,618,153	7,398,212	9,444,288	68.8	10,440,708	7,740,990	6,890,210	5,023,520
Oregon Short Line.....	April 259	2,273,854	260,395	2,534,249	610,347	508,101	799,188	78.9	577,138	297,547	216,988	160,304
.....	4 mos. 259	9,526,865	1,139,016	10,665,881	1,830,737	1,212,978	3,442,869	72.2	3,182,827	2,113,112	1,760,177	1,514,716
Oregon-Wash. R. R. & Nav. Co.	April 2,343	1,693,079	233,743	1,926,822	531,585	386,057	77,966	92.8	153,778	—46,054	—182,164	—49,659
.....	4 mos. 2,343	6,839,580	1,029,306	7,868,886	1,781,771	1,569,400	3,425,389	88.3	1,017,375	246,184	—301,247	—25,529
Los Angeles & Salt Lake.....	April 1,209	1,308,303	283,444	1,591,747	406,464	356,247	589,036	89.3	190,338	52,498	—43,044	59,502
.....	4 mos. 1,209	5,319,094	1,177,397	6,496,491	1,421,747	1,534,259	2,498,149	86.5	1,003,317	456,401	56,477	322,446
St. Joseph & Grand Island.....	April 258	283,980	10,707	294,687	34,929	39,540	101,376	68.7	98,433	74,974	58,610	3,369
.....	4 mos. 258	1,155,575	46,661	1,202,236	153,639	155,332	421,531	63.7	460,680	363,916	299,679	112,339
Utah	April 111	116,928	54	117,482	16,991	39,373	34,677	74.4	29,989	24,546	17,093	23,628
.....	4 mos. 111	603,710	72	603,782	90,853	166,764	127,117	67.7	195,325	163,837	126,232	169,621
Virginian	April 545	1,234,472	34,626	1,269,098	177,739	281,673	14,596	91.6	518,892	389,696	413,935	787,393
.....	4 mos. 545	5,685,742	134,347	5,820,089	725,808	1,344,491	1,371,025	58.5	2,580,676	1,994,461	2,139,151	3,704,763
Wabash	April 2,524	4,589,542	557,196	5,146,738	745,487	980,286	2,109,241	76.9	1,279,970	1,048,431	717,072	602,286
.....	4 mos. 2,524	18,535,825	2,255,092	20,790,917	2,669,497	3,937,490	729,938	75.8	5,384,008	4,350,441	3,117,306	2,854,452
Ann Arbor	April 293	437,841	71,505	509,346	51,418	92,090	116,534	74.9	118,584	92,490	57,824	91,804
.....	4 mos. 293	1,763,411	273,999	2,037,410	176,288	374,483	771,805	75.3	467,522	370,484	262,207	283,417
Western Maryland	April 878	1,385,950	28,612	1,414,562	249,677	301,991	407,100	71.6	414,877	329,877	346,594	423,132
.....	4 mos. 878	5,903,519	125,214	6,028,733	892,608	1,244,321	1,838,753	69.7	1,880,649	1,500,649	1,490,200	1,892,503
Western Pacific	April 1,050	989,662	114,917	1,104,579	327,414	265,496	451,195	98.2	21,850	—74,448	—36,404	21,392
.....	4 mos. 1,050	3,738,970	377,174	4,116,144	1,002,817	981,608	1,830,557	95.0	220,528	—168,795	28,998	313,828
Wheeling & Lake Erie.....	April 511	1,403,803	25,976	1,429,779	214,558	368,437	434,997	73.3	403,804	276,814	275,449	275,449
.....	4 mos. 511	5,272,452	99,255	5,371,707	672,702	1,432,294	1,744,955	73.2	1,522,103	1,027,866	1,027,311	1,222,167
Wichita Falls & Southern.....	April 168	74,118	2,895	77,013	17,224	12,946	2,448	76.55	18,954	13,981	13,981	18,954
.....	4 mos. 168	281,746	9,938	291,684	65,614	49,342	107,029	80.22	61,516	40,545	29,836	88,063

News of the Week

(Continued from page 1349)

belief," with having violated Section 7 of the Clayton law in purchasing stock of the Western Maryland. The effect of the purchase, the commission says, may be to substantially lessen competition between the two roads and to restrain commerce in certain sections and communities. Similar complaints have been issued against the Kansas City Southern and Missouri-Kansas-Texas in connection with the acquisition of stock of the M-K-T and St. Louis Southwestern and the Baltimore & Ohio, New York Central and New York, Chicago & St. Louis because of the acquisition of stock of the Wheeling & Lake Erie.

The complaint recites that the Baltimore & Ohio and Western Maryland are in competition; that in February, 1927, the Baltimore & Ohio acquired 144,789 shares of the 7 per cent cumulative first preferred stock, 8,000 shares of 4 per cent noncumulative convertible second preferred stock, and 159,000 shares of common stock of the Western Maryland; that on or about February 15, 1927, it entered into an agreement with Speyer & Co., whereby it received an option to purchase 19,070 shares of first preferred stock, and that the agreement has been extended from time to time to August 15, 1928.

The Baltimore & Ohio is given an opportunity to show cause at a hearing on July 2 why an order should not be entered requiring it to divest itself of all interest in the stock of the Western Maryland; and is given 30 days in which to file an answer to the complaint.

Consider Simpler Methods of Handling

A conference of shippers, carriers, and warehousemen to consider simplified methods of handling goods was held on June 6 at the Department of Commerce, Washington, under the joint auspices of the Bureau of Foreign and Domestic Commerce and the commercial standards group of the Bureau of Standards. The purpose of the conference was to consider the use and extension through co-operative effort of simplified methods of handling, moving, loading and unloading goods; to promote the development of interchangeability in the equipment required for handling goods; and to promote the establishment of such dimensional standards as may be necessary to secure interchangeability of equipment.

The conference adopted resolutions endorsing the general idea of undertaking to reduce further the cost of distributing and handling commodities in general commerce and proposing the appointment of a committee and sub-committees to deal with the various phases of material handling methods, in co-operation with the Department of Commerce. It was resolved that the first effort in reducing the cost of handling commodities in distribution be toward bringing out interchangeability of skid and lift truck equipment.

Traffic

The Long Island reports that in the first week of operation under its spring timetable, when a large number of new trains are put on, all trains in the busy suburban district in and around New York City, reached destination with a much better record than was ever before made. Each day the percentage of trains finishing their trips on time was from 94.6 per cent to 98.8 per cent. About 200 new men have to be employed in the passenger train service at this time of the year.

The Central of New Jersey has contracted for space at Forty-second street, Times Square, New York, for the erection of a poster advertising its Sandy Hook steamer service to the New Jersey Atlantic Highlands. The painting of the poster, which will contain fourteen colors and which will be illuminated from dusk to dawn each day, was begun on May 29. The advertisement will be maintained, during the period of service of the S. S. "Sandy Hook" and the "Monmouth," of the Jersey Central fleet, said to be the fastest steamers in New York Harbor.

The Southern Pacific has established a development and colonization department. It will work with existing agencies such as the national, state and county farm bureaus, the Grange, the Farmers' Union, agricultural colleges and other civic organizations. R. E. Kelly, manager of development, in charge of public relations work, has been appointed manager of development and colonization.

The Chicago, Burlington & Quincy, in conjunction with the Great Northern, has established a four-day tour of Glacier and Waterton Lakes national parks. By leaving Chicago on the Oriental Limited, tourists may spend four days in the mountains of these parks and yet be at destinations in the Pacific northwest within a week. From Glacier park, they may return to Chicago within a limit of eight days.

P. R. R. Sends Officers to Europe to Study Airways

As an initial step toward organizing the new transcontinental air and rail passenger service between New York and Los Angeles, the Pennsylvania is sending to Europe two of its passenger traffic officers for the purpose of making an intensive study of the airplane systems of the Continent and England. These officers are Charles H. Mathews, Jr., assistant general traffic manager, and Major C. E. McCullough, general passenger agent. They sailed on June 7, on the Belgenland from New York for Plymouth, England, and will accompany Lieutenant C. S. Jones, American pilot and war-time aviator.

Their investigations will be devoted particularly to questions of commercial arrangements, including the handling of

baggage, and problems involving the comfort and convenience of passengers with respect to airports and flying service.

Refuse Suspension

The Interstate Commerce Commission has refused to suspend tariffs filed by the Illinois Central establishing, in connection with the Redwood Steamship Line, Inc., via the Panama canal, joint rail-and-water rates on iron and steel articles from the Chicago district and on canned goods from Mississippi points via New Orleans to destinations in California on a parity with rates on iron and steel from the Pittsburgh district and rates on canned goods from points in Trunk Line territory.

The reduced freight rates which are now in effect on certain commodities over the Illinois Central from Chicago to California by the way of New Orleans and the Panama Canal, as put into effect on May 31, are the subject of a circular which has been issued by the Chicago Association of Commerce, through its transportation committee, asking shippers to take particular notice of these tariffs and to avail themselves of the reductions as compared with rates by other routes.

Examples given are: canned goods, Chicago to California terminals, all rail, \$1.05 per 100 lb., by the canal route 81 cents per 100 lb.; soap, all rail, \$1.25, by canal, 60 cents; iron and steel manufactured articles, all rail, \$1.00, by canal 61 cents.

Charges for Policing Liquors

The Interstate Commerce Commission has suspended from June 5 to January 5, 1929, tariffs which proposed to extend the application of the scale of charges now provided for policing shipments of alcoholic liquors, l.c.l., between stations on the Louisville & Nashville, the Illinois Central, the Mobile & Ohio and several other southern lines, to apply over numerous other lines in Southern Classification territory. These charges, which are assessed in addition to the regularly applicable freight charges, range from \$10 per shipment for distances of 100 miles and under, up to \$46 per shipment for a distance of 1,000 miles.

Reduction in Lake Cargo Rates Protested

Protests asking the Interstate Commerce Commission to suspend the tariffs filed to become effective on June 18 reducing the rates on lake cargo coal from the Pennsylvania and Ohio districts, to meet the reduction that recently went into effect from the Southern coal districts, have been filed with the commission by the West Virginia public service commission, the Fairmont Coal Operators' Association, the southern coal operators' committee and the city of Detroit. The tariffs provide that upon presentation of proof to the delivering line that coal has been loaded into vessels at Lake Erie ports specified, and has been discharged from vessels at ports on Lakes Huron, Michigan or Superior the rates will be 20 cents a ton less. The tariffs expire at

midnight on December 31, unless sooner cancelled, changed or extended.

Dairy Demonstration Train For Idaho

The Oregon Short Line announces that beginning July 9, that road in cooperation with the Idaho College of Agriculture, is to run an educational train throughout its lines in southern Idaho, on an itinerary extending through two weeks. Beginning at Nampa on Monday, July 9, it is planned to visit 36 towns, the timetable in most cases providing for visits to three towns each day. There will be qualified dairy specialists from the College of agriculture to speak at every stop; and in cooperation with these, there will be other live stock specialists. The train will consist of 11 cars and will carry extensive exhibits of high grade dairy cattle of all representative breeds and there will be elaborate inanimate exhibits.

Among the suggestions to local committees in the way of working up interest in advance, the railroad company proposes that the telephone company, in any given community, be asked to put on a general "ring," in the evening before the train is due to arrive, telling the telephone subscribers what is coming and urging their attendance.

Trans-Missouri-Kansas Shippers' Advisory Board

The effect of 17,500 "combines" in the wheat fields of Kansas, on the number of box cars that will be required to move a crop that promises to be one of the largest in the history of that state, will be the main topic for consideration at the meeting of the Trans-Missouri-Kansas Shippers' Advisory Board at Wichita, Kan., on June 20. At that time, each railroad in the wheat belt will report the number of cars it has ready. Because of the expected heavy yield, coupled with the great increase in the number of combines in service, the roads are possibly confronted with a question more serious than any presented for several years. J. E. Gorman, president of the Chicago, Rock Island & Pacific, and Colonel Paul Henderson, vice-president of National Air Transport, Inc., will address the meeting.

Freight Charges on Livestock

The net return received by the producer of livestock, after freight and other distribution costs have been paid, was greater in 1927 than in any similar period in the last four years, according to a study just completed by the Bureau of Railway Economics into the relationship of livestock prices to transportation costs.

The distribution of each dollar paid by the purchaser of livestock, which includes cattle and calves, hogs, and sheep, follows:

Item	1924	1925	1926	1927
To freight	5.6	4.5	4.3	3.8
To other distribution costs	3.0	2.5	2.3	2.2
To the producer or shipper	91.4	93.0	93.4	94.0
Total	100.0	100.0	100.0	100.0

The study is based on sales made at

ten large markets in 1924, 1925, 1926 and 1927. The ten markets are: Baltimore, Maryland; Chicago, Illinois; East St. Louis, Illinois; Ft. Worth, Texas; Jersey City, New Jersey; Kansas City, Missouri; Lancaster, Pennsylvania; Nashville, Tennessee; South Omaha, Nebraska; and South St. Paul, Minnesota.

"The average price," according to the bulletin, "paid by the purchaser for the three classes of livestock combined was \$7.36 per 100 lb., in 1924, \$8.93 in 1925, \$9.27 in 1926, \$9.56 in 1927 and \$8.65 over the four years. The average amount absorbed by freight charges was 41 cents per 100 lb., in 1924, 40 cents in 1925 and 1926, 37 cents in 1927, and 40 cents over the four years. Other costs of distribution averaged 22 cents in 1924 and 1925, 21 cents in 1926 and 1927, and 22 cents over the four years. The average net proceeds to the seller at shipping point was \$6.73 per 100 lb., in 1924, \$8.31 in 1925, \$8.66 in 1926, \$8.98 in 1927, and \$8.03 over the four years. Thus on a hundred-pound basis, the price paid by the purchaser increased gradually each year and the combined freight charges and other costs of distribution declined slightly each year, whereas the net proceeds to the seller at shipping point increased gradually each year. The increase over the four-year period in net proceeds per hundred pounds to the seller at shipping point was both relatively and actually greater than the increase in average price paid by the purchaser."

Representative Hoch Again Advises the I. C. C.

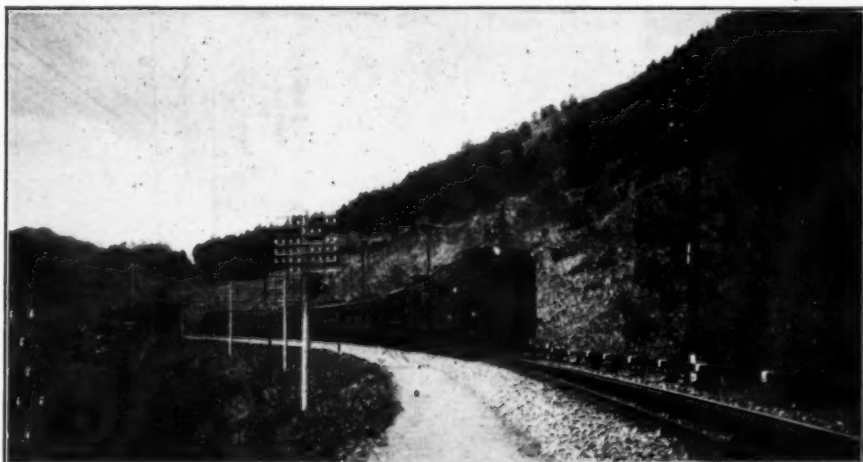
Representative Hoch, of Kansas, has written another letter to Chairman Campbell of the Interstate Commerce Commission, regarding the size of the record being accumulated by the commission in connection with its investigations of grain and livestock rates under the Hoch-Smith resolution. He says he dissents from Chairman Campbell's position that "the existence of an agricultural depression must be established fully by evidence in

commission proceedings before the commission can legally proceed in the adjustment of farm freights," and argues that the commission ought to take the word of Congress, as expressed in the resolution in January, 1925, which uses the words: "in view of the existing depression in agriculture."

"Congress, which under the Constitution has the sole authority to regulate interstate commerce," he says, "and for which the Commission is merely an agency in this regard, stated in legislative enactment the fact of an agricultural depression—a fact which had been common knowledge—and that statement constitutes, as I view it, merely the legislative reason for directing that farm freights be placed on 'the lowest possible lawful rates' consistent with maintenance of adequate transportation service. . . . The reason Congress had for making this direction, namely, the existence of an agricultural depression, is not in my opinion an evidential fact necessary to be established in the usual way before the Commission. In other words, I think that the Commission was not only justified in assuming the existence of an agricultural depression, but that in fact it was not necessary for the Commission to assume anything at all about that, but simply to follow the mandate of Congress to readjust farm freights in order to give them a preferential status within the zone of 'just and reasonable' rates. I am not now speaking of the requirement that it must be shown by proper evidence that particular farm commodities in question are affected by the depression, but I am only speaking of the general fact of the existence of a farm depression. I do not at all believe it to be necessary to permit the railroads to take the time of the Commission in denying in general the existence of an agricultural depression, and I think that, in pursuing such tactics, the railroad attorneys give affront to proper public sentiment in the farm country."

If nothing further can be done to hasten action, Mr. Hoch says, "it raises a very serious question as to whether or not we do not need some changes in our rate-making machinery."

* * *



Electric Train on Rack Rail Section, Shinetsu Line, Japanese Government Railways

Equipment and Supplies

Locomotives

THE ALUMINUM COMPANY OF AMERICA has ordered for its Alco power plant 2 four-wheel switching locomotives, from the American Locomotive Company. These locomotives will have 14 by 22-in. cylinders, and a total weight in working order of 80,000 lb.

THE CHICAGO & ILLINOIS MIDLAND is inquiring for 2 Mikado type locomotives.

THE MISSOURI PACIFIC has ordered 5, 2-8-4 type locomotives from the American Locomotive Company. These locomotives will have 28 by 30 in. cylinders, and a total weight in working order of 385,000 lb. Inquiry for this equipment was reported in the *Railway Age* of May 19.

Passenger Cars

THE NEW YORK, CHICAGO & ST. LOUIS is inquiring for 1 business car.

THE MISSOURI-KANSAS-TEXAS is inquiring for from 6 to 19 baggage and mail cars.

THE CANADIAN NATIONAL is inquiring for 3 steel baggage and mail cars 63 ft. long.

THE UNION PACIFIC is inquiring for 4 gas-electric rail motor cars and 8 trailer cars.

Freight Cars

THE MISSOURI PACIFIC will build 200 automobile cars in its DeSoto, Mo., shops.

THE SEABOARD AIRLINE is inquiring for 1,000 box cars of 40 tons capacity.

THE PITTSBURGH & SHAWMUT is inquiring for 6 caboose cars.

THE ILLINOIS CENTRAL is inquiring for 2 air dump cars.

THE CHICAGO, ROCK ISLAND & PACIFIC is inquiring for 250 composite gondola car bodies.

THE MISSOURI-KANSAS-TEXAS is inquiring for 10 air dump cars of 20 cu. yd. capacity.

THE CHICAGO, ST. PAUL, MINNEAPOLIS & OMAHA has ordered 200 flat cars from the Pullman Car & Manufacturing Corporation.

THE SOUTHERN PACIFIC will build 50 caboose cars, 50 gondola cars and 500 flat cars in its own shops. Inquiry for this equipment was reported in the *Railway Age* of April 7.

Iron and Steel

THE UNION PACIFIC has ordered 350 tons of structural steel for miscellaneous bridge work from the American Bridge Company.

THE SOUTHERN has ordered 1,000 tons of steel for a bridge in Alabama, from the American Bridge Company.

THE PENNSYLVANIA has ordered 600 tons of steel for a bridge in Indiana, from the Bethlehem Steel Company.

THE CHICAGO, BURLINGTON & QUINCY has ordered 200 tons of structural steel for miscellaneous bridge work from the American Bridge Company.

THE NEW YORK, CHICAGO & ST. LOUIS has ordered 400 tons of structural steel for bridges at Cleveland, Ohio from the McClintic-Marshall Company.

THE NEW YORK CENTRAL has ordered 2500 tons of steel, from the American Bridge Company, for bridges, and has placed an order for 1200 tons for a building at South Bend, Ind.

Signaling

THE BOSTON & ALBANY has ordered from the General Railway Signal Company material for an electric interlocking at Tower 43, West Springfield, Mass.; 53 working levers. The order includes 23 d.c. switch machines, 110-volt.

* * *



A View of the T. H. & B. Car Ferry Showing Operation Difficulties in the Ice of Lake Erie

Supply Trade

David Thomas has been appointed manager of bar iron sales of the Reading Iron Company, Reading, Pa.

J. B. Dearborn has been appointed Illinois representative of the Calumet Steel Company, Chicago, to succeed H. J. Elander, resigned.

The Pyle-National Company, Chicago, has opened an office in the Oliver building, Pittsburgh, Pa. Thomas P. McGinnis is in charge of the office.

The Botfield Refractories Company, Philadelphia, Pa., has arranged for the distribution of its products in Toledo, O., and vicinity, to be handled by the Builders & Industrial Supply Company, 4090 Detroit street, Toledo.

The Pyle-National Company, Chicago, has opened an office in the Little building, Boston, Mass., in charge of Carl S. Geis; the company also opened an office in the Marine Bank building, Houston, Tex., in charge of Alexander E. Johnson.

The Oliver Iron & Steel Corporation, Pittsburgh, Pa., has opened a new warehouse at Nineteenth and Campbell streets, Kansas City, Mo., in charge of W. M. Waters, district manager. A complete stock of pole line material will be maintained at this warehouse.

George F. Schlesinger, director of highways of Ohio, has resigned effective June 15, to become chief engineer and managing director of the National Paving Brick Manufacturers Association, which position he will assume on July 1. The headquarters of the latter association, which are now in Chicago, will be moved to Washington, D. C.

D. A. Merriman, general manager of sales of the American Steel & Wire Company, Chicago, has been elected vice-president and general manager of sales. H. B. Maguire, assistant manager of the Detroit sales office, has been promoted to assistant to the vice-president and general manager of sales at Chicago.

The Wright Aeronautical Corporation has bought 15 acres of land and several buildings, part of the Cooke plant, of the American Locomotive Company, at Paterson, N. J. This is adjacent to the present Wright plant comprising five acres of land and buildings, that the company holds under lease.

Edward E. Gold, president of the Gold Car Heating & Lighting Company since its organization, has been elected chairman of the board and Frank W. Dearborn, who has been for a long time connected with the company, was elected president to succeed Mr. Gold. Franklin H. Smith of the sales department, was elected assistant treasurer, all with headquarters at Brooklyn, N. Y.

R. J. McComb, western manager of the Q and C Company, at Chicago, has resigned to become sales manager of the Woodings Forge & Tool Company, Verona, Pa. Mr. McComb was born at New Castle, Pa., and educated at Pennsylvania State College. He entered railway service in 1905 with the Wheeling & Lake Erie and later became engineer maintenance of way and superintendent of construction. Mr. McComb resigned in 1918 to become affiliated



R. J. McComb

with the Q and C Company, and now leaves that company to go to the Woodings Forge & Tool Company.

George C. Scott, vice-president of the United States Steel Products Company, New York, has been elected president, succeeding E. P. Thomas, who, on June 1, assumed his new duties as vice-president in charge of commercial matters, of the United States Steel Corporation. Mr. Scott started work with the St. Louis Wire Mill Company, which was absorbed by the Consolidated Steel & Wire Company. Mr. Scott was then transferred to its Cleveland office in charge of exports to the Far East. This company was merged with the Ameri-

can Steel & Wire Company of Illinois in 1898, and Mr. Scott was then transferred to New York City, where he was



George C. Scott

manager of the export department. On the formation of the United States Steel Products Company in 1903, Mr. Scott became a departmental manager in charge of sales in the Far East, Australia and South Africa, and since March, 1920, he served as vice-president of the same company.

Obituary

W. B. Johnson, sales representative for Ross F. Hayes, New York, died at his home in Flushing, N. Y., on May 28, at the age of 28.

Trade Publications

PROJECTED STEEL WINDOWS.—The Bogert & Carlough Company, Paterson, N. J., has issued J-28, describing and illustrating the Boca solid steel projected windows which it manufactures. The bulletin also includes details of the window construction and specifications for their installation.

* * *



Union Station at Worcester, Mass.

The two large towers were taken down last year because of the difficulty of keeping them waterproof.

Construction

CANADIAN PACIFIC.—The provincial railway department of Alberta has approved the plans of this company for the construction of a line from Breton, Alta., the northern terminus of the recently acquired Lacombe & Northwestern, to Leduc, 41 miles. It is planned to receive tenders for the construction of 28 miles of this extension from Breton within a short time. The remaining 13 miles will be constructed in 1929.

CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS.—In connection with the construction of the Cleveland (Ohio) Union Terminal this company plans the extension of existing highway subways, the construction of several new overhead bridges, an addition to the roundhouse at Linndale, Ohio, and a new coaling station at the same point. Although the project has not yet been authorized this railroad contemplates the extension of its roundhouse and the construction of a repair shop at Bellefontaine, Ohio.

CINCINNATI UNION TERMINAL.—This company has engaged Fellheimer and Wagner, New York architects, to design the proposed Union passenger station at Cincinnati, Ohio. Work will start immediately on the preparation of plans for the station, a site for which has been selected in the Mill Creek Valley, facing Lincoln Park.

ERIE.—This company has awarded a contract to the De Hamil Construction Company, Cleveland, for the erection of a postoffice building at Binghamton, N. Y., to be known as the Erie Terminal Post-office.

MISSOURI PACIFIC.—A contract for the construction of a car assembly yard to serve the plant of the Chevrolet Motor Company at Leeds, Mo., has been awarded to Ross and Wogan, Kansas City, Mo. The total cost of the yard is estimated at \$250,000.

LOUISIANA & ARKANSAS.—A contract for the construction of an addition to the passenger station at Shreveport, La., has been awarded to K. C. Wilson, Shreveport.

MISSOURI-KANSAS-TEXAS.—A contract for a change of line and the reduction of grade from 0.7 per cent to 0.5 per cent at Wilsonton, seven miles south of Parsons, Kan., has been let to the C. J. List Construction Company, Kansas City, Mo. The cost of this work is estimated at about \$159,000.

MONTOUR.—Hearings were begun before C. V. Burnside, assistant director of the Bureau of Finance of the Interstate Commerce Commission, in May, on this company's application for authority to acquire control of the Pittsburgh, Lisbon & Western, (both companies are controlled by the Pittsburgh Coal Company) and on the application of the Pittsburgh, Lisbon & Western for a certificate au-

thorizing the construction of an extension from Milrock to Youngstown, Ohio, 27 miles, with a 4-mile branch to Struthers, near Youngstown, and a line from Negley to Smith's Ferry, on the Ohio river, 13 miles, for the purpose of providing a more direct route for the movement of coal from western Pennsylvania to the Youngstown district by rail and river. The New York Central, Baltimore & Ohio and the Pennsylvania have intervened in opposition.

NEW YORK CENTRAL.—This road has awarded contracts to Merritt, Chapman & Scott, Inc., New York, for the construction of an additional intake at Glenwood power station, Yonkers, N. Y., and to Miller-Blyth, Inc., New York, for the construction of a substation at Philipse Manor, N. Y. Contracts also have been awarded to the John Johnson Construction Company, Buffalo, N. Y., for electrical and platform work at Central Station, Buffalo.

OREGON, CALIFORNIA & EASTERN.—Contracts have been awarded by this company for the construction of an extension from Sprague River, Ore., to Bly, 26 miles. A contract for the grading involved in the construction of 19 miles of the line immediately east of Sprague River has been let to Johnson & Johnson while a contract for the grading on the nine miles of line west of Bly has been let to Morgan & Vicory. It is expected that grading of the extension will be completed by September 1.

PENNSYLVANIA.—This road has let a contract to Allen N. Spooner & Son, Inc., New York, for the construction of a freight delivery warehouse at Kearny, N. J. This warehouse will be of steel and concrete construction and is expected to cost approximately \$190,000. The John F. Casey Co., Pittsburgh, Pa., has received a contract from this road for concrete paving and curbing for driveways in the new produce yard at Pittsburgh, Pa. This work has been estimated to cost about \$45,000.

SOUTHERN PACIFIC.—William Sproule, president, has announced plans of this company for the construction of a bridge over Carquinez strait between Suisun Point, Cal., and Army Point, northeast of San Francisco, to replace a train ferry service now in operation between Benicia and Port Costa and shorten the time of trains between San Francisco and points north and east by 20 to 35 minutes. The bridge will be double tracked and will have a total length of 5,597 ft., including a viaduct 750 ft. long, 10 spans each 408 ft. long, one span 384 ft. long and one lift span 327 ft. long. The bridge will provide a 70-ft. clearance above mean high tide with the lift span closed and with the lift span open the clearance will be 135 ft. The cost of the bridge is estimated at \$10,000,000.

THOUSAND ISLANDS.—This road contemplates the construction of a new passenger station at Gananoque, Ont. Detailed plans for the structure have not yet been developed.

Financial

BOSTON & ALBANY.—*Bonds.*—The Interstate Commerce Commission has authorized this company to issue \$5,700,000 of 4½ per cent improvement bonds to be delivered to the New York Central in payment for additions and betterments; authority is also granted to the Central to assume liability as guarantor for these bonds and to sell them at not less than 96 plus accrued interest.

CHICAGO & NORTH WESTERN.—*Bonds.*—The Interstate Commerce Commission has authorized this company to procure the authentication and delivery to it of \$1,375,000 of general mortgage bonds of 1987, to reimburse its treasury in part for capital expenditures and retirement of other securities.

CINCINNATI, NEW ORLEANS & TEXAS PACIFIC.—*Lease of Cincinnati Southern.*—The Interstate Commerce Commission has authorized the modification and extension of the lease under which the C. N. O. & T. P. operates and controls the Cincinnati Southern. The lease approved by the electorate of the City of Cincinnati, which owns the latter road, will extend 99 years from January 1, 1928. It calls for a rental of \$1,250,000 until 1946; then \$1,350,000 until 1966; \$1,450,000 until 1986; \$1,600,000 until 2006; and \$1,700,000 until 2026. In addition the C. N. O. & T. P. will pay \$12,000 per year toward trustees' expense, interest and a 1 per cent sinking fund on city bonds issued for terminal improvements and a contingent annual rental rising from 2 per cent to 6 per cent on the difference between net railway operating income and the fixed rental, including interest and sinking fund accruals. The fixed rental will range from 3 per cent to 4.3 per cent on the I. C. C.'s tentative valuation of the road. The C. N. O. & T. P. has spent \$18,000,000 on this property and sought the extension of the lease before embarking on a further program, the initial stage of which will involve \$13,500,000.

NEW YORK CENTRAL.—*Annual Report.*—The annual report of this company is summarized on adjacent advertising pages.

NEW YORK CENTRAL.—*Stock Issue.*—The board of directors of the New York Central Railroad on May 31, voted to issue additional capital stock amounting to \$42,158,300, par value. This stock, which is to be offered for subscription to stockholders of record at the close of business June 15, will be used to pay, in part, \$50,000,000, face amount, of Lake Shore & Michigan Southern 4 per cent 25-year bonds. The authorized capital stock of the company amounts to \$500,000,000. With the new issue, there will be outstanding \$463,741,535. Each stockholder will be entitled to subscribe for one share for each ten shares held, payment for shares subscribed for to be made at par in two installments of \$50 each per share by Au-

gust 29 and December 14. At his option, the subscriber may make payment of \$101.27 per share on or before August 29 and receive a full paid certificate entitled to dividends payable after that date. Shares paid for in installments will be entitled to dividends on and after February 1, 1929. Subscription warrants will be mailed to stockholders of record soon after June 15. Both full share and fractional warrants will be issued. Subscriptions will be received by the general treasurer of the company in New York and by Morgan, Grenfell & Company in London until the close of business on August 29.

SALEM, WINONA & SOUTHERN.—*Abandonment.*—The Interstate Commerce Commission has authorized this company to abandon for interstate and foreign commerce a line from Horse Hollow, Mo., to Winona, 21.5 miles. Of this total, 2.5 consists of trackage rights over the Frisco, dismantling being planned for the remaining 19 miles.

SEABOARD AIR LINE.—*Abandonment.*—The Interstate Commerce Commission has authorized this company to abandon its Silver Springs, Fla., branch, 2 miles, and a 2.3-mile line from Welcome Jet., Fla., to Welcome.

SPOKANE, COEUR D'ALENE & PALOUSE.—*Abandonment.*—The Interstate Commerce Commission has authorized this company to abandon a branch line extending from Liberty Lake Jct., Wash., to Liberty Lake, 2.2 miles.

TERMINAL RAILROAD ASSOCIATION OF ST. LOUIS.—*Bonds.*—This company has applied to the Interstate Commerce Commission for authority to issue \$7,000,000 of refunding and improvement 4½ per cent bonds, to be sold at 97 and interest to J. P. Morgan & Co. The proceeds are to be used to retire a like amount of outstanding 6 and 7 per cent bonds of the St. Louis Merchants' Bridge Company.

DETROIT & Ironton.—*Acquisition.*—This company has applied to the Interstate Commerce Commission for authority to issue \$4,000,000 of its 5 per cent first mortgage bonds and \$500,000 of common stock, in return for all the physical assets of the Ford Transportation Company, which owns equipment and a yard now operated by the Detroit, Toledo & Ironton. This is a step toward the unification of the Ford transportation properties.

UNION PACIFIC.—*Bonds.*—The Interstate Commerce Commission has authorized this company to issue \$20,000,000 of 40-year 4 per cent bonds, proceeds of which will be used to pay off the principal on an equal amount of 6 per cent bonds which mature on July 1. The bonds will be sold to Kuhn, Loeb & Co., at 90.5 and accrued interest.

WESTERN MARYLAND.—*Officers and Directors.*—The Interstate Commerce Commission has authorized M. C. Byers, George P. Bagby, J. W. Broome, F. C. Uhlman, and S. R. Gelert to be officers and/or directors of the Western Maryland
(Continued on page 1364)

Annual Report

The New York Central Railroad Company

To the Stockholders of

THE NEW YORK CENTRAL RAILROAD COMPANY:

The Board of Directors herewith submits its report for the year ended December 31, 1927, with statements showing the income account and the financial condition of the company.

The year's business

The company's total operating revenues for the year were \$383,377,311.19, a decrease from 1926 of \$16,160,437.67, while total operation income was \$61,868,872.11, a decrease of \$10,311,895.70. Due to an increase in non-operating income, however, net income for 1927, \$58,565,145.30, was \$2,901,104.32 more than for the previous year.

Income account for the year

INCLUDING BOSTON AND ALBANY RAILROAD AND THE OHIO CENTRAL LINES			
	Year ended Dec. 31, 1927 6,906.21 miles operated	Year ended Dec. 31, 1926 6,928.09 miles operated	+Increase —Decrease —21.88 miles
OPERATING INCOME			
Railway operations			
Railway operating revenues	\$383,377,311.19	\$399,537,748.86	—\$16,160,437.67
Railway operating expenses	293,399,836.25	298,931,037.51	—5,531,201.26
NET REVENUE FROM RAILWAY OPERATIONS	\$89,977,474.94	\$100,606,711.35	—\$10,629,236.41
Percentage of expenses to revenues	(76.53)	(74.82)	(+1.71)
Railway tax accruals	\$25,193,779.94	\$26,881,808.16	—\$1,688,028.22
Uncollectible railway revenues	106,116.97	167,079.84	—60,962.87
RAILWAY OPERATING INCOME	\$64,677,578.03	\$73,557,823.35	—\$8,880,245.32
Equipment rents, net debit	\$5,831,379.94	\$4,693,332.90	+\$1,138,047.04
Joint facility rents, net credit	2,977,628.96	3,294,001.85	—\$ 316,372.89
NET RAILWAY OPERATING INCOME	\$61,823,827.05	\$72,158,492.30	—\$10,334,665.25
MISCELLANEOUS OPERATIONS			
Revenues	\$844,401.48	\$813,799.30	+\$30,602.18
Expenses and taxes	799,356.42	791,523.79	+7,832.63
MISCELLANEOUS OPERATING INCOME	\$45,045.06	\$22,275.51	+\$22,769.55
TOTAL OPERATING INCOME	\$61,868,872.11	\$72,180,767.81	—\$10,311,895.70
NON-OPERATING INCOME			
Income from lease of road	\$118,545.02	\$115,047.46	+\$3,497.56
Miscellaneous rent income	3,913,012.56	3,158,978.52	+754,034.04
Miscellaneous non-operating physical property	218,305.67	526,187.65	—307,881.98
Separately operated properties—profit	1,046,006.81	1,229,921.14	—183,914.33
Dividend income	31,260,564.75	18,224,254.89	+13,036,309.86
Income from funded securities and accounts	3,230,591.21	3,185,453.76	+45,137.45
Income from unfunded securities and accounts	2,551,845.74	2,380,356.19	+171,489.55
Income from sinking and other reserve funds	168,311.39	150,669.85	+17,641.54
Miscellaneous income	101,495.85	105,820.56	—4,324.71
TOTAL NON-OPERATING INCOME	\$42,608,679.00	\$29,076,690.02	+\$13,531,988.98
GROSS INCOME	\$104,477,551.11	\$101,257,457.83	+\$3,220,093.28
DEDUCTIONS FROM GROSS INCOME			
Rent for leased roads	\$14,360,838.39	\$14,340,187.51	+\$20,650.88
Miscellaneous rents	893,639.29	891,107.36	+2,531.93
Miscellaneous tax accruals	266,405.56	235,189.54	+31,216.02
Separately operated properties—loss		11,271.25	—11,271.25
Interest on funded debt	29,292,539.92	29,268,397.17	+24,142.75
Interest on unfunded debt	334,765.77	67,025.88	+267,739.89
Amortization of discount on funded debt	501,155.70	525,267.95	—24,112.25
Maintenance of investment organization	5,266.60	5,665.29	—398.69
Miscellaneous income charges	257,794.58	249,304.90	+8,489.68
TOTAL DEDUCTIONS FROM GROSS INCOME	\$45,912,405.81	\$45,593,416.85	+\$318,988.96
NET INCOME	\$58,565,145.30	\$55,664,040.98	+\$2,901,104.32
DISPOSITION OF NET INCOME			
Dividends declared (7½ per cent in 1927; 7 per			

	Year ended Dec. 31, 1927	Year ended Dec. 31, 1926	+Increase —Decrease
cent in 1926)	\$30,462,783.11	\$26,827,814.64	+\$3,634,968.47
Sinking and other reserve funds	159,054.11	145,179.41	+13,874.70
Investment in physical property	650.00		+650.00
TOTAL APPROPRIATIONS OF INCOME	\$30,622,487.22	\$26,972,994.05	+\$3,649,493.17
SURPLUS FOR THE YEAR CARRIED TO PROFIT AND LOSS	\$27,942,658.08	\$28,691,046.93	—748,388.85

Profit and Loss account

BALANCE TO CREDIT OF PROFIT AND LOSS, DECEMBER 31, 1926		\$185,439,566.85
ADDITIONS:		
Surplus for the year 1927	\$27,942,658.08	
Profit on property sold	120,290.46	
Profit on securities sold	91,840.71	
Accounting adjustments in connection with sundry properties in Grand Central Terminal area	5,458,699.99	
Sundry adjustments (net), unrefundable overcharges and uncollectible accounts	210,005.41	33,823,494.65
		\$219,263,061.50
DEDUCTIONS:		
Surplus appropriated for investment in physical property	\$119,804.38	
Depreciation prior to July 1, 1907, on equipment retired during year	389,923.73	
Loss on property retired	826,418.74	1,336,146.85
BALANCE TO CREDIT OF PROFIT AND LOSS, DECEMBER 31, 1927		\$217,926,914.65

Revenues, tonnage and passengers

Freight revenue was \$234,381,108.95, a decrease of \$13,984,344.13, while revenue freight tonnage moved was 111,717,008 tons, a decrease of 6,069,150, of which over one-half was in anthracite and bituminous coal. In 1926 large stocks of anthracite were moved to replace the reduced supply following the strike which prevailed during the latter part of 1925, whereas in 1927 shipments were below normal, as a result, in large part, of the mild weather in the latter part of the year. Other important factors contributing to the falling off in anthracite tonnage were the increase in the installation of oil-burning facilities in private homes and the increasing use since the strike of 1925 by household consumers of bituminous coal in substitution for anthracite. In the first few months of 1926 there was a heavy movement of bituminous coal and coke, due to the shortage of anthracite resulting from the strike, and, during the last half of 1926, there was a heavy movement of bituminous coal for export, due to the strike in the British coal fields, while in 1927 shipments of bituminous coal were curtailed, due to unsettled labor conditions following the calling of a strike for April 1 and to decreased demand from industries. Lumber shipments fell off, attributable in part to the Mississippi Valley floods and to decrease in building operations. A diminishing supply of pulpwood in certain territories and the consumption in the manufacture of newsprint paper in Canada of pulpwood which would formerly have been exported to the United States caused a decrease in the volume of that commodity. Lessened activities in the iron and steel industries were reflected in the lower tonnage of related commodities and there was a decrease in automobile traffic. Freight tonnage generally in the section of New England served by the company's lines was adversely affected by the November floods.

Passenger revenue was \$99,105,313.67, a decrease of \$808,421.74, the number of revenue passengers carried being 71,095,708, a decrease of 81,413. While interline passengers decreased 77,027 and local passengers 1,383,183, there was an increase in commutation passengers of 1,378,797, reflecting the continuing development of suburban territory served by the lines of the company.

Mail revenue was \$8,124,843.19, a decrease of \$443,479.16, and express revenue was \$12,715,244.25, a decrease of \$870,032.74, the falling off in both instances being the result of the smaller volume of traffic handled.

Milk revenue was \$6,594,083.05, an increase of \$282,481.81. Switching revenue was \$4,581,575.72, a decrease of \$132,628.15, and demurrage was \$1,169,153.63, a decrease of \$276,776.64, these decreases being accounted for by the smaller freight tonnage handled.

Other transportation and joint Facilities revenues were \$16,705,988.73, an increase of \$72,763.08.

Operating expenses were as follows:

[ADVERTISEMENT]

Operating expenses			
Group	Amount	Increase	Decrease
Maintenance of way and structures	\$54,277,070.93	\$372,214.98	
Maintenance of equipment	79,614,279.96		\$4,572,733.68
Traffic expenses	5,150,923.62	198,468.17	
Transportation expenses	134,615,446.12		1,234,751.54
Miscellaneous operations	5,814,662.80	42,859.95	
General expenses	14,193,053.37		357,580.73
Transportation for investment—credit	265,600.55	20,321.59	
Total	\$293,399,836.25		\$5,531,201.26

Expense for maintenance of way and structures increased \$372,214.98. There was no material change in the volume of ordinary work upon the company's roadway as a whole, but the 1927 expenses include the effect of wage increase awards as well as a larger amount for retirement of facilities. In addition, the year's expenses include charges for the restoration of roadway on the Boston & Albany Railroad after the November flood.

Expense for maintenance of equipment decreased \$4,572,733.68. There were fewer locomotives receiving heavy repairs in 1927 and less units of this class of equipment were retired from service. The number of freight and passenger cars receiving general or heavy repairs also showed a substantial decrease.

Traffic expenses increased \$198,468.17, due largely to an increase in the company's representation in off-line territory.

Transportation expenses decreased \$1,234,751.54. Included in such expenses in 1927 was approximately \$3,850,000 representing wage increases awarded during the year and \$350,000 for outlay resulting from the flood in New England. These increases were more than offset by increased efficiency, by reduced expenditures for train and other service due to a smaller volume of business handled and by a decrease both in consumption and cost of fuel.

General expenses decreased \$357,580.73, the principal item contributing thereto being reduced valuation expenses.

Railway tax accruals

Railway tax accruals, details of which will be found on another page, were \$25,193,779.94, a decrease of \$1,688,028.22. The greater part of this decrease was in federal income tax accruals due to the smaller amount of taxable income. Discontinuance of the federal capital stock tax was also a factor. An increase in accruals to cover property taxes is mainly attributable to increased assessments and to additions and betterments.

Equipment rents

There was an increase in net debit for freight cars of \$1,435,115.82, largely attributable to the return to the company's rails of a large number of its cars by foreign lines during the falling off in business, thus reducing the per diem revenue. There was an increase in net debit for rental of work equipment of \$8,859.88. Partly offsetting these increased net debits were increased net credits as follows: increased rentals from locomotives, \$89,785.86, due mainly to the larger number of locomotives leased to system lines; increased net credit from rentals of passenger cars, \$28,345.40, the result of a lessened use by the company of the passenger equipment of other roads; and a decrease in rentals paid for floating equipment, \$187,797.40, caused by lessened use by the company of chartered boats.

Joint facility rents

There was a net credit to the company in 1927 for rents involving joint facilities of \$2,977,628.96, a decrease of \$316,372.89, largely due to an increase in rents payable resulting from adjustments affecting prior years.

Miscellaneous operations

This account includes only the operation of the company's livestock yards at Buffalo with a gross income of \$844,401.48 for 1927, an increase of \$30,602.18 over the previous year, and a net income of \$45,045.06, an increase of \$22,769.55.

Non-operating income

Miscellaneous rent income, \$3,913,012.56, increased \$754,034.04 mainly in increased rentals, and through adjustments of rentals between the company and the New York State Realty and Terminal Company (the capital stock of which is entirely owned by the company), affecting properties in the Grand Central Terminal area.

Income from miscellaneous non-operating physical property decreased \$307,881.98, largely the result of adjustments as to properties in the Grand Central Terminal area. There were also heavier expense charges against this class of income.

Profit from separately operated properties decreased \$183,914.33 as the result of the smaller amount received account of operation of the Pittsburgh McKeesport and Youghiogheny Railroad.

Dividend income increased \$13,036,309.86. An extra dividend

of 50 per cent amounting to \$9,292,050 and an increase in regular dividend from 35 to 40 per cent amounting to \$932,460 on the company's holdings of stock of The Michigan Central Railroad Company account for \$10,224,510 of this increase. An extra dividend of 10 per cent on stock of The Pittsburgh and Lake Erie Railroad Company and dividends on the increased holdings of stock of that company resulting from a stock dividend of 20 per cent received during the year amounted to \$1,979,240. Dividends of 7¼ per cent in 1927, as compared with 7 per cent in 1926, on stock of The Cleveland Cincinnati Chicago and St. Louis Railway Company account for \$322,058.25, and additional holdings of \$4,817,500 and an extra dividend of 2 per cent on the company's Reading common stock account for \$374,833.90.

Income from funded securities and accounts increased \$45,137.45, principally in interest on loans to affiliated companies.

Income from unfunded securities and accounts increased \$171,489.55, largely in interest on the cost of work under construction and in interest due from lessees of various buildings in the Grand Central Terminal area. Offsetting these increases in part were reductions in interest income due to smaller bank balances and a smaller aggregate amount of loans outstanding.

Deductions from gross income

Deductions from gross income were \$45,912,405.81, an increase of \$318,988.96, mainly in interest on unfunded debt due to adjustments between the company and the New York State Realty and Terminal Company in connection with properties in the Grand Central Terminal area.

Net income before dividends and other appropriations

The net income of the company was \$58,565,145.30, an increase of \$2,901,104.32, and amounted to 13.90 per cent upon the capital stock outstanding at the end of the year.

Dividends

Date declared	Date payable	Rate per cent	Amount
March 9, 1927	May 2, 1927	1¾	\$6,706,955.41
June 15, 1927	August 1, 1927	2	16,876,275.50
September 14, 1927	November 1, 1927	2	7,665,093.90
December 14, 1927	February 1, 1928	2	8,425,641.90
Total for year, 7¼ per cent			\$30,462,783.11

Surplus

After charges for dividends aggregating \$30,462,783.11 and other appropriations amounting to \$159,704.11, there remained a surplus for the year of \$27,942,658.08 which was carried to the credit of profit and loss. At the end of the year the total corporate surplus was \$220,524,740.34.

Property investment accounts

The increases in the property investment accounts for the year, shown in detail elsewhere in this report, were:

Road	\$19,822,315.63
Equipment	16,876,275.50
Miscellaneous physical property	7,217,886.16
Improvements on leased railway property	8,391,000.45
a total of	\$52,307,477.74

Increase in authorized amount of capital stock and issue of additional stock

The increase in the authorized capital stock of the company from \$400,000,000 to \$500,000,000 referred to in the 1926 report to the stockholders was made effective during 1927.

Stockholders of record at the close of business on August 10, 1927, were offered the right to subscribe for additional stock of the company, at par, to the extent of ten per cent of their holdings. \$38,027,200 of stock was issued during the year upon subscriptions made under this offer, making the total outstanding on December 31, 1927, \$421,285,435.

Stockholders

The following table shows the number of stockholders of the company at the end of each year since the consolidation:

Date		Total		In United States		Abroad	
		Number	Average holding	Number	Average holding	Number	Average holding
December 31, 1915		25,042	100	22,270	104	2,772	64
December 31, 1916		22,532	111	21,836	112	696	56
December 31, 1917		27,102	92	26,771	92½	331	69
December 31, 1918		28,693	87	28,395	87	298	69
December 31, 1919		30,445	82	30,180	82	265	67
December 31, 1920		32,396	77	32,173	77	223	64
December 31, 1921		34,328	73	33,824	73	504	70
December 31, 1922		34,319	78	33,843	78	476	70
December 31, 1923		34,946	77	34,502	77	444	70
December 31, 1924		36,282	84	35,856	84	426	66
December 31, 1925		40,660	94	40,238	94½	422	64
December 31, 1926		61,580	62	61,174	62	406	69
December 31, 1927		54,530	77	54,146	77	384	72

Changes in funded debt

The changes in the funded debt of the company, in detail, were as follows:

The amount on December 31, 1926	\$694,380,123.64
has been increased as follows:	
Mortgages on real estate in the City of New York assumed	61,000.00
	\$694,441,123.64

and has been reduced as follows:

New York & Northern R. R. Co. first mortgage 5 per cent bonds due October 1, 1927	\$1,185,000.00	
Mortgage on real estate in the city of New York paid	24,000.00	
Payments falling due during the year and on January 1, 1928, on the company's liability for principal installments under equipment trust agreements as follows:		
N. Y. C. & H. R. R. Co. (Boston & Albany) Trust of 1912, October 1, 1927	500,000.00	
N. Y. C. Lines Trust of 1913, January 1, 1928	742,117.67	
N. Y. C. R. R. Co. Trust of 1917, January 1, 1928	1,117,000.00	
Trust No. 43 of January 15, 1920, January 15, 1927	922,700.00	
N. Y. C. R. R. Co. Trust of 1920, April 15, 1927	1,153,167.33	
N. Y. C. Lines Trust of 1922, June 1, 1927	572,000.00	
N. Y. C. Lines 4½ per cent Trust of 1922, September 1, 1927	569,000.00	
N. Y. C. Lines Trust of June 1, 1923, June 1, 1927	462,000.00	
N. Y. C. Lines Trust of 1924, June 1, 1927	983,000.00	
N. Y. C. Lines 4½ per cent Trust of 1924, September 15, 1927	848,000.00	
N. Y. C. Lines Trust of 1925, May 15, 1927	734,000.00	9,811,985.00

leaving the funded debt on December 31, 1927 \$684,629,138.64

a net decrease of \$9,750,985.00.

Proposed leases of lines of controlled companies

The proceedings before the Interstate Commerce Commission in which the company is seeking the authority of the Commission for the leasing of the Michigan Central Railroad, the Cleveland Cincinnati Chicago and St. Louis Railway, and other lines, as described in the Annual Report for 1926, are still pending. Hearings took place in January, 1927, but the case was reopened for the introduction of additional evidence at a hearing to be held early in 1928.

West Side Improvements, including electrification, in New York City and vicinity

The Committee of Engineers, referred to in the Annual Report for 1926, completed their task and filed their report with the Mayor of the City of New York on May 13, 1927, with a map indicating the changes to be made and the location and grades of the 30th Street Branch between Spuyten Duyvil and St. John's Park, with some incidental municipal improvements. The plan contemplates a new southerly terminal at West and Spring Streets, and the abandonment for railroad purposes of the tracks on the surface of Canal Street and Hudson Street, together with the St. John's Park freight terminal. The capacity of the new Spring Street terminal will very considerably exceed that of St. John's Park station, the tracks being above the street level. From the Spring Street terminal running tracks continuing at the high level extend north through private property along the westerly margin of Washington Street, crossing Tenth Avenue, and proceeding along the westerly margin of Tenth Avenue to the 30th Street yard, which will be extensively reconstructed to conform to the new grades. From the 30th Street yard the running tracks are depressed and are planned to traverse private property east of Eleventh Avenue below street grades, entering the 60th Street yard at subgrade, and upon a rising elevation reaching the present grade of the company's right-of-way at 72nd Street. The plan also involves the elimination of all existing grade crossings between 72nd Street and Spuyten Duyvil. The elimination of the grade crossings in the region of Manhattanville and at Dyckman Street has advanced to a point nearing completion.

Many hearings have been held in regard to the plan submitted by the Committee of Engineers and various modifications have been under consideration, but the plan has not as yet been formally adopted by the Board of Estimate and Apportionment of the City of New York.

The installation of appliances for third-rail electrification has materially progressed between Harmon and 72nd Street. Experimental electric locomotives, designed for the road haul of freight trains south of Harmon, and on the Harlem Division south of North White Plains, have been delivered and tested. The Port Morris Branch, including the industrial sidings, is now electrically operated. Experiments are being made with Diesel electric engines suitable for hauling trains on the main line of the Putnam Division and south of 72nd Street on the 30th Street Branch.

Automatic train control

During the year, in addition to the installations of train control which have been previously reported to the stockholders and which were made pursuant to the orders of the Interstate Commerce Commission, voluntary installations have been made, which by the 28th of December, resulted in equipping the main line with automatic train control between Poughkeepsie, New York, and Elkhart, Indiana. The remaining link between Elkhart and Englewood, Illinois, will be placed in service during the early part of January; so that after that time all trains will be fully protected with train

control on the main line between Poughkeepsie and Chicago. The Boston & Albany having been previously fully equipped, all trains between Boston and Chicago will be protected.

Valuation of the company's property by the Interstate Commerce Commission

During the year 1926 and the early part of the year 1927, representatives of the company were engaged in conferences with the representatives of the Bureau of Valuation of the Interstate Commerce Commission for the purpose of arriving, if possible, at agreements concerning the cost of reproduction new, depreciation and the land values of the property of the company and its leased lines as of June 30, 1917. These conferences were predicated upon the assumption of the correctness of the methods, rules and principles employed by the Commission with a reservation of the right of the company, at formal hearing, to contest the correctness of these methods, rules and principles. On this basis agreements were reached in many instances. The tentative valuation of the properties was served during the month of June, 1927. A protest thereto was duly filed. The case came on for formal hearing before the Commission in August, 1927, being consolidated with the cases of The Michigan Central Railroad Company, The Pittsburgh and Lake Erie Railroad Company, The Cleveland Cincinnati Chicago and St. Louis Railway Company, and other system lines. Briefs were subsequently filed and oral argument submitting the case was had on November 30, 1927. A decision may be expected during 1928.

Container car service

Container car service has been materially increased. The merchandise containers, numbering 5 cars and 30 containers in 1922, have increased to 49 cars and 300 containers and arrangements have been made for a very considerable extension of this service. The brick containers have increased from 1 car and 12 containers in 1923 to 455 cars and 5,460 containers in 1927. During the year the brick container, with minor structural changes, demonstrated its adaptability for handling other classes of traffic. Thirty cars with 360 containers have been satisfactorily used in the handling of small stone, and 6 cars with 72 containers are now regularly used in the transportation of bulk lime.

Floods on Boston & Albany Railroad

As a result of heavy rainfall on November 3, the Boston & Albany suffered from a series of landslides and washouts between Pittsfield and Springfield, Massachusetts. The most serious washout occurred on November 4, when, as a result of the breaking of a dam at the Wheeler Reservoir, Becket, about 3½ miles of double track, as well as three bridges between Becket and Middlefield, were washed away. On November 15, the work of rebuilding one track was completed and practically normal service was restored over the Albany Division. The second track was placed in service on November 30. The cost of rebuilding tracks and bridges and detouring trains is estimated at \$750,000, and the loss of revenue is estimated at \$200,000.

Twenty-fifth anniversary of The Twentieth Century Limited

The company's fast long-distance train between New York and Boston and Chicago, known as The Twentieth Century Limited, reached its twenty-fifth anniversary on June 15, 1927. This train, which at its inauguration was, and still is, the fastest train for the distance in the world, has increased from the five cars each way to a train in each direction of from three to five sections, and in some instances as many as seven sections, of ten to twelve cars each. The anniversary was appropriately celebrated at the Grand Central Terminal in New York and the La Salle Street Terminal in Chicago.

Pensions

During the year 501 employees were retired and pensioned; 233 at the age of 70, 193 for disability, and 75 voluntarily on service pension. There were 2,934 pensioners at the close of the year. The total amount paid in pensions for the year was \$1,598,653. The balance in the reserve set up to provide for payments upon pensions granted in 1925, and subsequently was, at the end of the year, \$7,044,889.

Changes in organization

The Board records the following:

January 26, 1927, William Cooper Procter elected a Director to fill the vacancy caused by the resignation of Frank J. Jerome.

June 1, 1927, Ira A. Place appointed Senior Law Vice President; Robert J. Cary, Vice President and General Counsel; and Charles C. Paulding, Vice President, Public Relations.

The Board wishes to express its appreciation of the loyal and efficient service of the officers and employees of the company during the year.

For the Board of Directors,
P. E. CROWLEY
President.

Financial News

(Continued from page 1360)

and also of the following properties; Baltimore & Cumberland Valley Extension; Chesapeake & Curtis Bay; Fairmont Bingamon; Fairmont Helen's Run; Greenbrier, Cheat & Elk; Somerset Coal Railway; and Williamsport, Nessler & Martinsburg.

WESTERN PACIFIC.—Annual Report.—The annual report for 1927 shows net income after interest and other charges of \$394,851 equivalent to \$1.43 per share on 275,000 shares of 6 per cent preferred stock. Net income in 1926 was \$2,470,264, or \$1.72 per share on 475,000 shares of common stock. Selected items from the income statement follow:

WESTERN PACIFIC	1927	1926
RAILWAY OPERATING REVENUES	16,433,463	16,057,065
Maintenance of way.....	3,084,060	2,272,357
Maintenance of equipment	2,949,422	2,519,762
Transportation	5,393,342	5,093,697
TOTAL OPERATING EXPENSES	13,125,069	11,275,140
Operating ratio	79.87	70.22
NET REVENUE FROM OPERATIONS	3,308,394	4,781,926
Railway tax accruals..	1,503,477	1,305,603
Railway operating income	1,804,114	3,474,610
Equipment rents, Cr....	284,619	642,879
Joint facility rents, Cr..	232,749	219,717
Non-operating income ..	2,218,749	2,429,945
GROSS INCOME	4,022,864	5,904,554
Rent of leased lines....	3,000	3,000
Interest on funded debt	2,137,962	2,058,522
TOTAL DEDUCTIONS FROM GROSS INCOME	3,628,013	3,434,291
NET INCOME	394,851	2,470,264
Disposition of Net Income:		
Income applied to sinking fund	50,000	50,000
Income balance carried to profit and loss.....	344,850	2,420,264

WARRIOR RIVER TERMINAL.—Notes.—The Interstate Commerce Commission has authorized this company to issue 5 per cent promissory notes to the amount of \$639,638.89 to be delivered to the Inland Waterways Corporation, which owns all its capital stock, in payment for advances to it by the parent company.

Average Prices of Stocks and of Bonds

	June 5	Last week	Last year
Average price of 20 representative railway bonds..	94.64	95.13	94.23
Average price of 20 representative railway stocks.	123.51	124.26	114.96

Dividends Declared

Chesapeake & Ohio.—Common, 2½ per cent, quarterly, payable July 1 to holders of record June 8.

Chicago, North Shore & Milwaukee.—Preferred, 1½ per cent, quarterly; prior lien, 1¾ per cent, quarterly, both payable July 1 to holders of record June 15.

Gulf, Mobile & Northern.—Preferred, 1½ per cent, quarterly, payable July 2 to holders of record June 15.

Erie & Pittsburgh.—\$0.87½, quarterly, payable June 10 to holders of record May 31.

Fonda, Johnstown & Gloversville.—Preferred, 1½ per cent, quarterly, payable June 15 to holders of record June 9.

Reading Company.—Second preferred, \$0.50, quarterly, payable July 12 to holders of record June 21.

Atchison, Topeka & Santa Fe.—\$2.50, semi-annually, payable August 1 to holders of record June 29.

Officers

Financial, Legal and Accounting

J. L. Ferris, auditor of passenger accounts of the New York Central, with headquarters at New York, has retired under the pension regulations of that road after 49 years of service. He will be succeeded by **R. C. Bromm**, assistant auditor of passenger accounts, who in turn will be succeeded by **J. J. Russell**.

Operating

A. B. Burpee has been appointed transportation assistant on the Alberta district of the Canadian Pacific, with headquarters at Calgary, Alta.

H. G. Worvel, assistant trainmaster on the Grand Rapids division of the Pennsylvania at Fort Wayne, Ind., has been transferred to Kalamazoo, Mich.

G. R. Mabie will resume the position of trainmaster of the Council Grove and Salina districts of the Missouri Pacific, with headquarters at Council Grove, Kan. Replacing **J. T. L. Brooks**, acting trainmaster at that point.

M. D. Thompson, superintendent of transportation of the Alberta district of the Canadian National, with headquarters at Edmonton, Alta., has been transferred to the Saskatchewan district, with headquarters at Saskatoon, Sask.

Effective June 1 the position of acting superintendent of terminals at New Orleans has been abolished by the Southern Pacific Lines. **J. H. Eddy**, acting superintendent of terminals at that point has been appointed superintendent of terminals at New Orleans succeeding **P. B. Torian**, deceased.

J. D. McMillan, superintendent of the Central region of the Canadian National, with headquarters at Belleville, Ont., has retired after 52 years of service. He was born in 1856 in the township of Eldon, Ont., and entered railway service in 1876 with the Toronto & Nipissing (now a part of the Canadian National) as a brakeman. He became a conductor in August, 1878, and served in that capacity on the lines north of Toronto until 1900 when he was advanced to rule instructor. In 1908 Mr. McMillan was appointed assistant trainmaster at Allandale, Ont., and on June 1, 1910, was appointed trainmaster at Lindsay, Ont. In 1916 he was appointed superintendent at Belleville, Ont., which position he was holding at the time he retired.

G. L. Hurley, superintendent of the South Carolina Division of the Seaboard Air Line, with headquarters at Savannah, Ga., has been appointed superintendent of the North Florida division, with headquarters at Jackson-

ville, Fla., succeeding **H. A. Benton**, who has been transferred in the same capacity to the South Carolina division, replacing Mr. Hurley. **O. R. Teague**, division superintendent at Charleston, S. C., has been appointed assistant superintendent of the South Carolina division, with the same headquarters. **J. H. Bowen**, trainmaster at Savannah, Ga., has been appointed assistant trainmaster with headquarters at Americus, Ga. He will be succeeded by **S. M. Dutton** as trainmaster at Savannah. **L. S. Peck**, trainmaster on the South Carolina division has been transferred to the North Florida division staff. **J. H. Sutton** has been appointed chief dispatcher, with headquarters at Savannah, Ga., succeeding **L. S. Kinnebrew**, who has been transferred to the North Florida division.

J. M. Symes, who has been promoted to superintendent of passenger transportation of the Western region of the Pennsylvania, with headquarters at Chicago, was born on July 18, 1895, at Glen Osborne, Pa. He entered railway service in May, 1916, as a clerk in the office of the auditor of through freight receipts at Pittsburgh, Pa., being transferred to the office of the trainmaster of



J. M. Symes

the Pittsburgh division later in the same year. He advanced through various positions in the trainmaster's office and in May, 1920, he entered the office of the general superintendent at Cleveland, Ohio. In 1923, Mr. Symes was promoted to freight movement director of the Central region, with headquarters at Pittsburgh, where he remained until May, 1927, when he was appointed chief clerk to the general manager of the Western region at Chicago. Mr. Symes' promotion to superintendent of passenger transportation became effective on May 16.

L. C. Twyman, who has been promoted to assistant superintendent of transportation of the Chicago, Burlington & Quincy, with headquarters at Chicago, has spent more than 28 years in the operating department of that railroad. He was born at Macomb, Ill., on January 22, 1882, and entered railway service on December 7, 1899, as a messenger on the Burlington at

that point. While working there he learned telegraphy and was then advanced to operator on the Galesburg division. After serving for a short time as car distributor in the office of the chief dispatcher of the Galesburg division, Mr. Twyman was promoted to assistant car distributor in the transportation department, with headquarters at Chicago, in October, 1905, being further promoted to chief clerk of that department in 1909. During federal control of the railroads, from April 1, 1918, to March 1, 1920, he served as transportation assistant in the transportation department of the Central Western region, returning to the Burlington as chief clerk in the transportation department at the end of that time. Mr. Twyman was promoted to general chief clerk in the transportation department on April 1, 1923. His promotion to assistant superintendent of transportation became effective on May 15.

E. W. Perrott, who has been promoted to superintendent of freight transportation of the Western region of the Pennsylvania, with headquarters at Chicago, has been in the operating department of that railroad for 27 years. He was born at Bucyrus, Ohio, on April 7, 1879, and entered railway service in 1897 as a yard clerk on the Toledo & Ohio Central (now a part of the New York Central) in that city. Four years later Mr. Perrott was transferred to



E. W. Perrott

Columbus, Ohio, and in January, 1902, he entered the service of the Pennsylvania at Pittsburgh, Pa., in the same capacity. He was then advanced through various positions in the office of the assistant trainmaster at Pittsburgh and transferred to the general superintendent's office where he became assistant chief clerk and later chief clerk. Mr. Perrott later acted as chief clerk to the superintendent of freight transportation at Pittsburgh and during federal control of the railroads he was assistant to the superintendent of freight transportation. In 1920 he was advanced to assistant to the general superintendent of transportation of the Western region at Chicago. His promotion to superinten-

dent of freight transportation became effective on May 16.

Harold A. Hobson, who has been promoted to superintendent of the Logansport division of the Pennsylvania, with headquarters at Logansport, Ind., has been in the service of that railroad for about 18 years. He was born at Flushing, Ohio, on April 3, 1886, and attended the public schools in that city. From 1903 to 1907, Mr. Hobson attended a preparatory school at Barnsville, Ohio, Mt. Union College at Mt. Union, Ohio, and Duffs Business College at Pittsburgh, Pa., entering railway service on May 28 of the latter year as an assistant on the engineering corps of the Pennsylvania on the construction of the Bedford yard near Cleveland, Ohio. During the summers of 1904, 1905 and 1906, he served with the engineering department of the Baltimore & Ohio on preliminary surveys, location and



Harold A. Hobson

construction in southeastern Ohio. Because of a reduction in forces Mr. Hobson left railroad service from the latter part of 1907 until May 1, 1909, when he returned to the Pennsylvania as an engineering assistant, then acting in various capacities in the maintenance of way department until 1914 when the valuation department was organized and he was advanced to pilot engineer. Mr. Hobson was in military service from 1917 to 1919 and on May 10, 1920, he was transferred to the operating department as acting assistant trainmaster. Until April 16, 1923, he served in various capacities in both the maintenance of way and transportation departments at Pittsburgh, Newcastle, Pa., and Cleveland and he was then appointed assistant trainmaster at Canton, Ohio, later being transferred to Pittsburgh. On November 16, 1925, Mr. Hobson was promoted to trainmaster of the Renovo division, being further promoted to assistant superintendent of the New York division on March 10, 1927. His promotion to superintendent of the Logansport division became effective on May 16.

John F. Henry, who has been appointed superintendent of the Atlantic and Camden Terminal divisions of the Penn-

sylvania, with headquarters at Camden, N. J., was born on September 25, 1887 at Branch, (now Torrence), Pa. He entered railway service on August 1, 1905, as a brakeman on the Pittsburgh division of the Pennsylvania. On September 24 of the



John F. Henry

same year he became freight brakeman, and on November 27 was advanced to locomotive fireman. On January 25, 1917, Mr. Henry became locomotive engineman, and on November 16 of that year he became a special apprentice. Mr. Henry was appointed assistant trainmaster at Pitcairn, Pa., on March 1, 1920, and the following year was transferred in the same capacity to Conemaugh, Pa. On September 16, 1926, he was appointed trainmaster at Chambersburg, Pa., and on January 1, 1927, was appointed passenger trainmaster at Philadelphia, which position he was holding at the time of his recent appointment as superintendent of the Atlantic and Camden Terminal divisions.

Traffic

W. McG. Brooks has been appointed general agent of the Atlantic Coast Line, with headquarters at Espigon del Arsenal, Havana, Cuba.

Frank A. Cleveland, assistant general freight agent of the Northern Pacific, with headquarters at Seattle, Wash., has been promoted to general freight agent, with headquarters remaining in the same city.

Chester M. Biggs, industrial agent in the freight traffic department of the Southern Pacific at Portland, Ore., has been promoted to general agent at Seattle, Wash.

H. E. Shepard, commercial agent of the Atlantic Coast Line, with headquarters at Mulberry, Fla., has been appointed general agent, with headquarters at Jacksonville, Fla. **A. R. Savage** will succeed M. Shepard as commercial agent at Mulberry.

Joseph M. Simon, assistant general freight agent of the Mobile & Ohio, with headquarters at St. Louis, Mo., has been promoted to general freight agent, with headquarters at the same point,

succeeding **W. H. Grumley** who has resigned. **R. A. Chadwick**, commerce agent at St. Louis, and **E. Wifler** have been appointed assistant general freight agents, with headquarters at St. Louis, Mo.

R. H. Eberly, assistant general freight agent of the Seaboard Air Line at Norfolk, Va., has been appointed senior assistant general freight agent, with the same headquarters. **O. C. Abrams** has been appointed assistant general freight agent at Norfolk.

W. H. Cunningham, general freight agent of the Nickel Plate district of the New York, Chicago & St. Louis, with headquarters at Cleveland, Ohio, has been promoted to assistant freight traffic manager with jurisdiction over the Eastern territory and with headquarters as before at Cleveland. **F. A. Curry**, assistant general freight agent of the Lake Erie and Western district, with headquarters at Indianapolis, Ind., has been promoted to assistant freight traffic manager with jurisdiction over the Central and Northwestern territory and with headquarters at Chicago. **J. S. Henney**, general freight agent of the Clover Leaf district, with headquarters at Toledo, Ohio, has been promoted to assistant freight traffic manager with jurisdiction over the Southern and Southwestern territory and with headquarters at St. Louis, Mo. **H. C. Fisher**, division freight and passenger agent at Sandusky, Ohio, has been promoted to assistant general freight agent of the Lake Erie and Western district, with headquarters at Indianapolis, succeeding Mr. Curry. **C. S. Stephens**, general agent of the freight department at Cleveland, has been promoted to assistant general freight agent, with headquarters at Cleveland.

B. J. Torbron, general freight agent of the Ohio Central lines of the New York Central, with headquarters at Chicago has been appointed general coal and ore agent, with headquarters at Cleveland, Ohio. **J. R. O'Malia**, general agent in the coal department at Cleveland, has been promoted to assistant general coal and ore agent, with headquarters at the same point, and the position of coal and ore agent has been abolished. **W. J. Keller**, assistant general freight agent at Chicago, has been promoted to general freight agent to succeed Mr. Torbron. **M. S. O'Connor**, chief of the tariff bureau at Chicago, has been promoted to assistant general freight agent replacing Mr. Keller and Mr. O'Connor has in turn been succeeded as chief of the tariff bureau by **W. T. Tannehill**.

Harry B. Light, who has been appointed coal freight agent of the Reading, with headquarters at Philadelphia, Pa., was born on August 22, 1893 at Lebanon, Pa. He graduated from the Lebanon High School in June, 1911, and in September of the same year he entered the service of the Philadelphia & Reading, at Lebanon. He served in the freight department at this point for two years and then entered the service of

the New York, New Haven & Hartford at Boston, Mass., as an accountant, where he remained for several years. He also spent several years in industrial traffic work, and three years as a traveling salesman, returning to the service of the Reading at New York on August 14, 1922. He was appointed general agent at New York on May 16, 1927 and served in this capacity until his recent appointment to the position of coal freight agent.

J. E. Anderson, assistant general freight agent of the Cleveland, Cincinnati, Chicago & St. Louis, with headquarters at Cleveland, Ohio, has been promoted to general freight agent in charge of solicitation and service, with headquarters at Cincinnati, Ohio, succeeding **George Krause, Jr.**, deceased. **W. B. Ferguson**, assistant general freight agent, with headquarters at Cincinnati, has been promoted to general freight agent in charge of rates and their division, rules and regulations governing the handling of freight traffic and tariff publication, with headquarters at the same point. **B. R. Brennan** has been appointed assistant general freight agent, with headquarters at Cleveland, succeeding Mr. Anderson.

Engineering, Maintenance of Way and Signaling

O. F. McNairy, division engineer on the Seaboard Air Line, with headquarters at Savannah, Ga., has been transferred in the same capacity to the North Florida division, with headquarters at Jacksonville, Fla. **A. O. Wilson** will replace Mr. McNairy as division engineer at Savannah.

D. M. Rankin, office engineer in the office of the division engineer of the Southern Kansas division of the Atchison, Topeka & Santa Fe, with headquarters at Chanute, Kan., has been promoted to division engineer, succeeding **H. A. Hatch**, who has been assigned to other duties in the office of the chief engineer of the Eastern lines at Topeka, Kan. **H. M. Swope**, acting division engineer of the Eastern division, has been promoted to division engineer, with headquarters as before at Emporia, Kansas.

Mechanical

H. Hickenbotham, car foreman in the Western region of the Canadian National at Port Mann, B. C., has been promoted to general car foreman of the British Columbia district, with headquarters at Vancouver, B. C.

Purchases and Stores

G. D. Tombs has been appointed division storekeeper on the Illinois Central, with headquarters at Memphis, Tenn., succeeding **A. E. Walters** who has resigned.

Russell J. Stackhouse, general store-

keeper of the Reading Company, at Reading, Pa., has retired under the pension regulations after 42 years of service with that road. **William H. Morris**, assistant general storekeeper, with headquarters at Reading, succeeds Mr. Stackhouse as general storekeeper, with the same headquarters.

The jurisdiction of **R. J. Gable**, division storekeeper on the Illinois Central, with headquarters at Clinton, Ill., has been extended to include all material and supplies of all departments on the Indiana division, succeeding **G. F. Ohden**, who has been assigned to other duties. Mr. Gable will also have under his jurisdiction all material of all departments on the Illinois division previously handled by the Burnside (Ill.) general storehouse. The jurisdiction of **E. S. Shapland**, division storekeeper at Waterloo, Iowa, has been extended to include all material and supplies of all departments on the Wisconsin division, succeeding **F. L. Rhynders**, who has been assigned to other duties.

Obituary

William Hodgdon, assistant to the general traffic manager of the Pennsylvania with headquarters at Chicago, who died on May 29, was born on October 29, 1859, at St. Louis, Mo. He entered railway service at the age of 19 years as a stenographer in the general freight office of the Ohio & Mississippi (now a part of the Baltimore & Ohio). During 1880 and 1881 Mr. Hodgdon studied law, returning to railway service as a clerk in the general freight office of the O. & M. For the next 15 years he served in that capacity, as traveling freight agent on the O. & M., as division freight agent at Springfield, Ill., and as assistant general freight agent of the Baltimore & Ohio Southwestern (now part of the Baltimore & Ohio) at St. Louis. In 1896 he was appointed general freight agent of the Cleveland, Akron & Columbus (now part of the Pennsylvania) at Cleveland, Ohio, and in 1901 he was transferred to Columbus, Ohio, and in addition became commercial agent of the Pittsburgh, Cincinnati, Chicago & St. Louis (now part of the Pennsylvania). From 1903 to 1907 Mr. Hodgdon was general freight agent of the Terre Haute & Indianapolis (now part of the Pennsylvania) and he was then promoted to freight traffic manager of the Pennsylvania lines west of Pittsburgh, Pa. On January 1, 1917, he was again promoted to traffic manager and for a period during federal control of the railroads he was traffic assistant to the regional director of the Alleghany region of the United States Railroad Administration. He returned to the Pennsylvania on March 1, 1920, as traffic manager of the Northwestern region, with headquarters at Chicago. On November 1, 1925, Mr. Hodgdon was appointed assistant to the general traffic manager. At the time of his death he had completed nearly 49 years in railway service.

